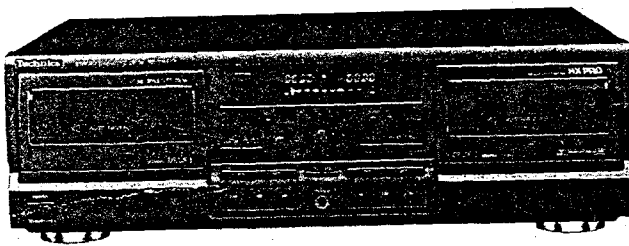


Service Manual

Cassette Deck
RS-TR474

Dolby NR-Equipped
Stereo Double Cassette Deck

*  **DOLBY B-C NR HX PRO**



AR-1 MECHANISM SERIES

Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(P)	U.S.A.	(K)
(PC)	Canada.	
(E)	Europe.	
(EB)	Great Britain.	
(EG)	Germany and Italy.	

* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang and Olufsen. "DOLBY", the double-D symbol and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

SPECIFICATIONS

■ CASSETTE DECK SECTION

Deck system	Stereo cassette deck
Track system	4-track, 2-channel
Recording system	AC bias
Bias frequency	80 kHz
Erasing system	AC erase
Heads	
DECK 1	Playback head (Permalloy) × 1
DECK 2	Recording/Playback head (Permalloy) × 1 Erasing head (Double-gap ferrite) × 1
Motors	
DECK 1	Capstan drive (DC servo motor) × 1 Reel table drive (DC motor) × 1
DECK 2	Capstan drive (DC servo motor) × 1 Reel table drive (DC motor) × 1
Tape speed	4.8 cm/sec. (1-7/8 ips)
Wow and flutter	0.1 % (WRMS)
For (E, EB, EG) areas	±0.2 % (DIN)
Fast forward and rewind times	Approx. 50 seconds with C-60 cassette tape
Frequency response (Dolby NR off)	
NORMAL	40 Hz - 15 kHz ± 3 dB
For (P, PC) areas	20 Hz - 17 kHz
For others	20 Hz - 16 kHz (DIN)
CrO ₂	40 Hz - 15 kHz ± 3 dB
For (P, PC) areas	20 Hz - 17 kHz
For others	20 Hz - 16 kHz (DIN)

METAL	40 Hz - 16 kHz ± 3 dB
For (P, PC) areas	20 Hz - 18 kHz
For others	20 Hz - 17 kHz (DIN)
S/N (Signal level = max recording level, CrO ₂ type tape)	
NR off	56 dB (A weighted)
Dolby B NR on	66 dB (A weighted)
Dolby C NR on	74 dB (A weighted)
Input sensitivity and impedance	100 mV/47 kΩ
REC (IN)	
Output voltage and impedance	500 mV/500 Ω
PLAY (OUT)	
HEADPHONES	
For (E, EB, EG) areas	30 mV/(8 Ω)
	(Load impedance 8 Ω - 600 Ω)

■ GENERAL

Power consumption	24 W
Power supply	
For (P, PC) areas	AC 60 Hz, 120 V
For others	AC 50/60 Hz, 230 V - 240 V
Dimensions (W × H × D)	430 × 136 × 285 mm (16-15/16" × 5-5/16" × 11-7/32")
Weight	4.4 kg (9.7 lb.)

Note:

Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

Technics

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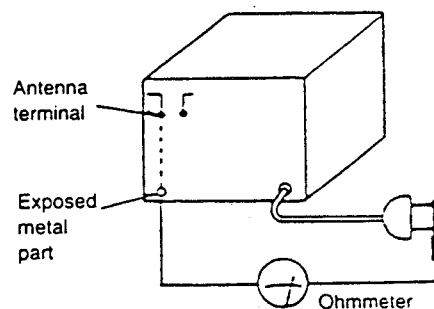
SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shrink, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

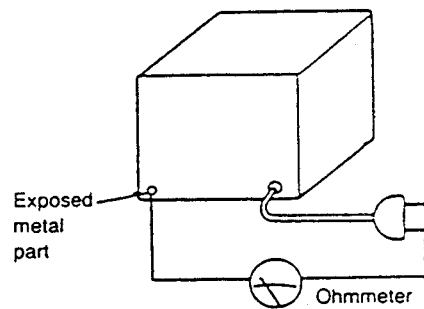
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3M Ω and 5.2M Ω to all exposed parts (Fig. A). Equipment without antenna terminals should read approximately infinity to all exposed parts (Fig. B).

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3 M Ω - 5.2 M Ω



(Fig. B)

Resistance = Approx. ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

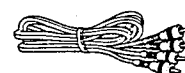
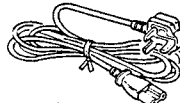
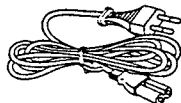
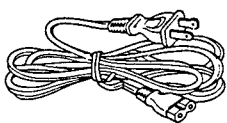
ACCESSORIES

AC power supply code 1 pc.
(SJA172)... (P, PC)

(RJA0019-2K)... (E, EG)

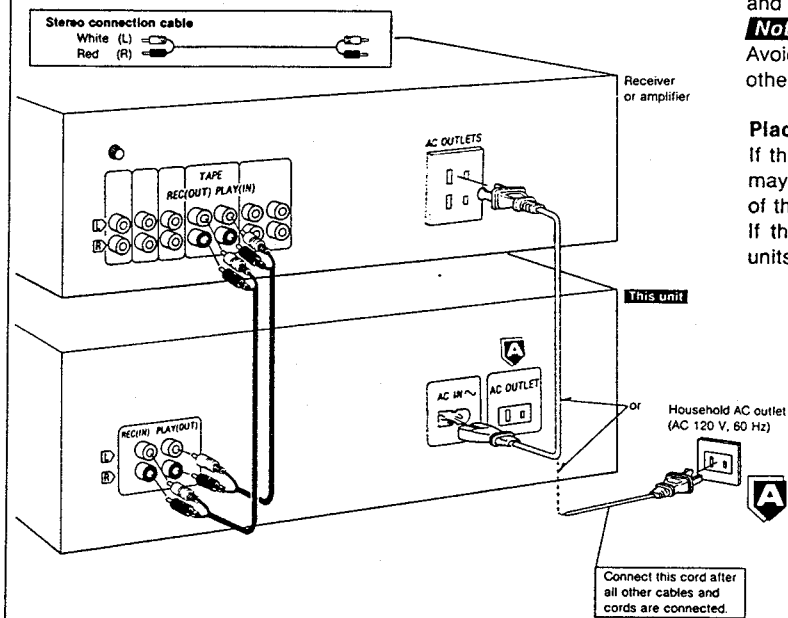
(VJA0733)... (EB)

Stereo connection cables 2 pcs.
(SJP2249-3)



CONNECTIONS

• For (P, PC) areas



Before making connections, make sure that the power to this unit and all other system components is turned off first.

Note

Avoid letting the cables touch each other as much as possible, otherwise noise will be generated.

Placement hints

If this unit is placed near a receiver or a tuner, a "hum" noise may be heard during tape playback, recording, or AM reception of the receiver or the tuner.

If this occurs, leave as much space as possible between the units, or place them where there is the least amount of "hum".

A "AC OUTLET" (UNSWITCHED)

Power is always available, regardless of the unit's power switch setting.

Audio equipment rated up to 100 W can be connected.

• For others

Before making connections, make sure that the power to this unit and all other system components is turned off.

Note

- Avoid letting the cables touch each other as much as possible, otherwise noise will be generated.
- Although the figure below shows the AC power supply cord being connected to a household AC outlet, if the amplifier (or receiver) is equipped with an AC outlet, connect the cord to that outlet.

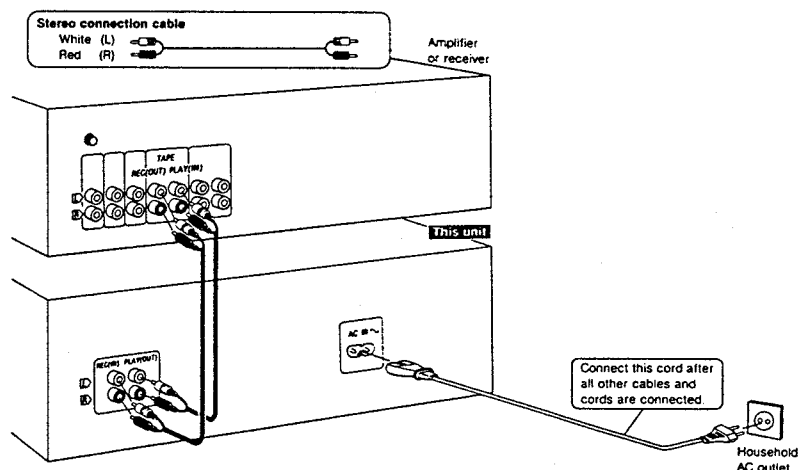
Placement hints

If this unit is placed near a receiver or a tuner, a "hum" noise may be heard during tape playback, recording, or AM reception of the receiver or the tuner.

If this occurs, leave as much space as possible between the units, or place them where there is the least amount of "hum".

For (EB) area only

BE SURE TO READ THE CAUTION FOR AC POWER SUPPLY CORD ON PAGE 3 BEFORE THE FOLLOWING CONNECTIONS.



■ CAUTION FOR AC MAINS LEAD


For (EB) area only

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:


Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

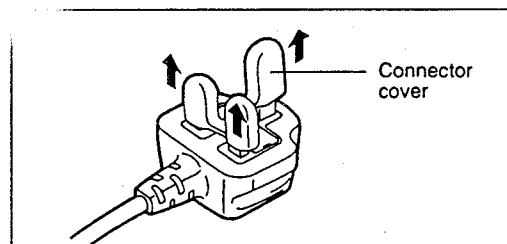
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol .

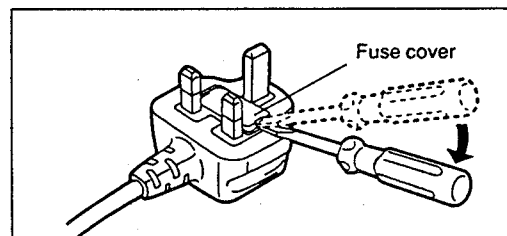
Before use

Remove the connector cover as follows.

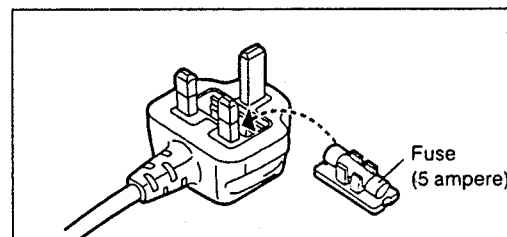


How to replace the fuse

1. Remove the fuse cover with a screwdriver.

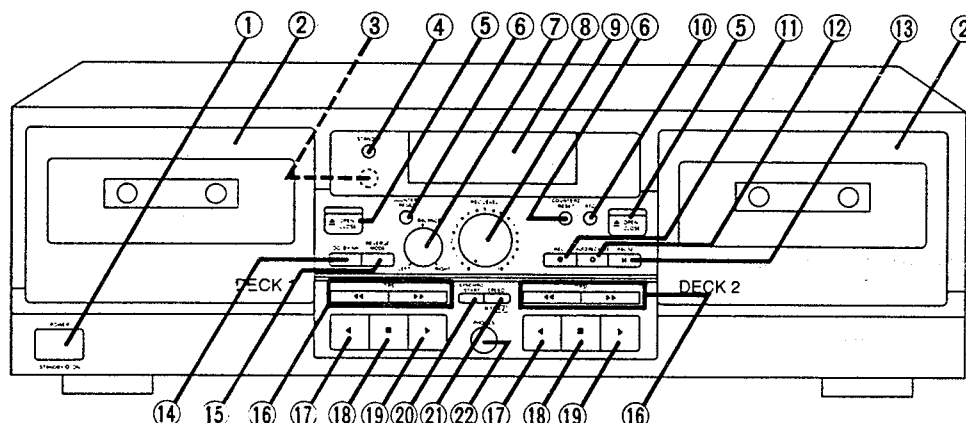







2. Replace the fuse and attach the fuse cover.









FRONT PANEL CONTROLS

When any of the numbers indicated below is repeated more than once (for example, ②), the number indicated on the left is the control for Deck 1 and that indicated on the right is for Deck 2.

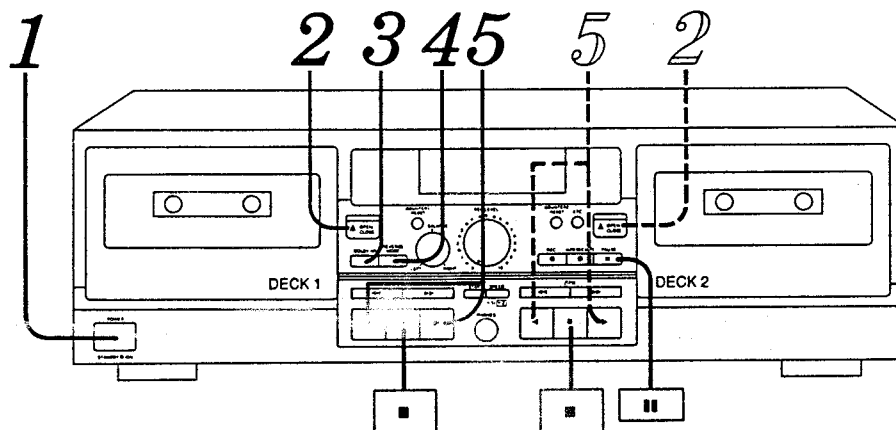


No.	Name
①	Power "STANDBY  /ON" switch (POWER, STANDBY  /ON) Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	Cassette holder
③	Remote control signal receptor
④	"STANDBY" indicator (STANDBY) When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on. For (E, EB, EG) areas
⑤	Open/close button ( OPEN/CLOSE)
⑥	Counter reset button (COUNTER RESET)
⑦	Recording-balance control (BALANCE)
⑧	Display
⑨	Recording-level control (REC LEVEL)
⑩	Auto tape calibration button (ATC)
⑪	Record button ( REC)
⑫	Automatic-record-muting button ( AUTO REC MUTE)

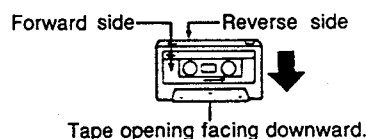
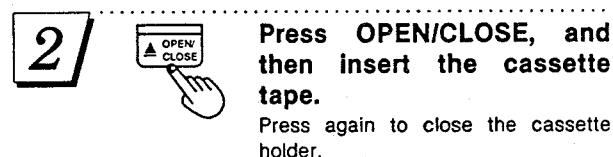
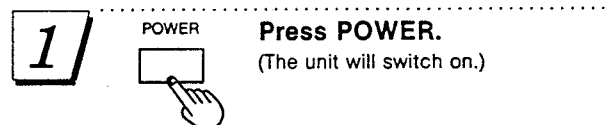
No.	Name
⑬	Pause button ( PAUSE)
⑭	Dolby noise-reduction button (DOLBY NR)
⑮	Reverse-mode select button (REVERSE MODE)
⑯	Rewind/fast-forward search buttons (  TPS)
⑰	Reverse-side playback button ()
⑱	Stop button ()
⑲	Forward-side playback button ()
⑳	Synchro-start button (SYNCHRO START)
㉑	Tape-to-tape recording-speed button (SPEED)
㉒	Headphones jack (PHONES) For (E, EB, EG) areas

PLAYBACK

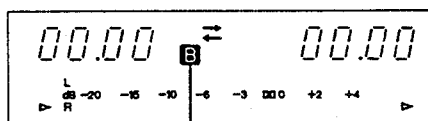
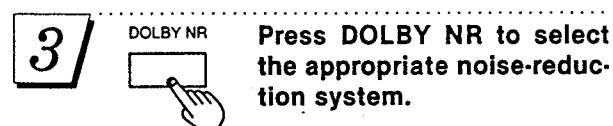
Either normal, CrO₂ or metal type cassettes can be used.



The procedures described below are an example of playback on Deck 1.

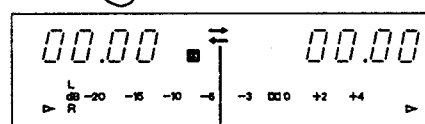
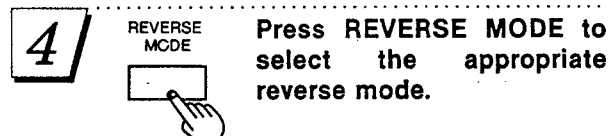


When the cassette holder is open, pressing ◀▶, ◀◀ or ▶▶ will close the holder and begin the desired function.



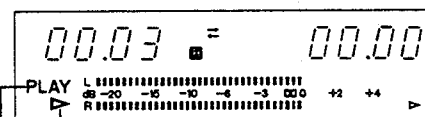
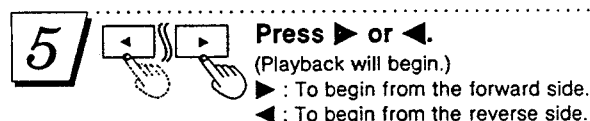
Each time the button is pressed, the indicators will change in the order: [B] → [C] → off.

Select the same type as that used for recording. When playing back a tape which was not recorded using a Dolby NR system, press so that the indicators go off.



Each time the button is pressed, the indicator will change in the order: → → → ∞.

→ : One side only.
∞ : Both sides repeatedly (up to 8 times).
∞ : Both sides, once only.
(Refer to page 7.)

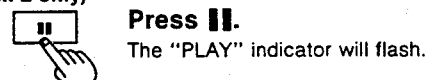


Illuminates Indicates the side being played.

To play back on Deck 2, in steps 2 and 5 above, press the buttons (2 and 5) for Deck 2.

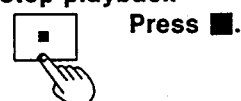
To temporarily stop playback

(Deck 2 only)



Press once again to resume playback.

To stop playback



Reverse function

The reverse function on this unit has three modes (→, ↺, ↻). Read the descriptions below and select the mode as desired.

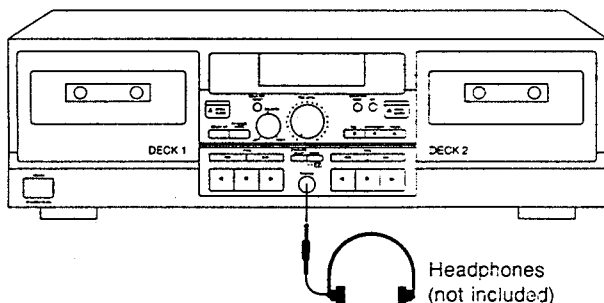
Mode	Tape travel
→ ←	Only one side of the tape (either the forward side or the reverse side) will be played, and operation will automatically stop when playback has been completed.
↺	Both sides of the tape will be played repeatedly eight times, and then operation will automatically stop. (If playback is begun from the reverse side, the forward side will be played seven times.)
↻	When there is a tape in only one of the decks Both sides of the tape will be played once, and then operation will automatically stop. (If playback is begun from the reverse side, the forward side will not be played.) When there is a tape in each of the decks The forward and reverse sides of the tape in Deck 1 will be played, followed by the forward and reverse sides of the tape in Deck 2, and after this operation is repeated eight times, operation will automatically stop. (If playback is begun from Deck 2, the tape in Deck 1 will be played seven times.)

To listen through headphones

(E, EB, EG) areas

Connect the headphones (not included) to the headphones jack.

Plug type: 1/4 inch phone plug, stereo type.



Note

Avoid listening for prolonged periods of time to prevent hearing damage.

About the automatic-tape-select function

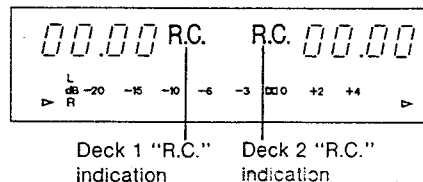
This unit is equipped with the automatic-tape-select feature; it automatically detects the type of tape being used, and then makes the suitable adjustments of the bias and equalization accordingly.

About the remote control function

When connecting a Technics amplifier with the remote control transmitter to this unit, you can operate this unit using a remote control transmitter of the amplifier.

(See the operating instructions of the amplifier.)

During operation from the remote control, the "R.C." indicator will light up.



About the Dolby noise-reduction system

The Dolby noise-reduction system is designed to effectively reduce the annoying high-frequency "hissing" noise typical of cassette tapes. During recording, the system functions to increase the high-frequency sound level, the sound, and then, during playback, that same portion is weakened to bring it back to the previous level.

This unit includes two types of Dolby noise-reduction systems, the Dolby B NR-type and C NR-type.

Dolby B-type noise-reduction

Noise is reduced to about one-third.

Use this system when playing back tapes recorded by the Dolby-B noise-reduction system, such as prerecorded music tapes, etc.

Dolby C-type noise-reduction

Noise is reduced to about one-tenth.

Use this system for the recording and playback of sound sources that have a wide dynamic range and good tone quality, such as FM broadcasts of live performances, etc., and for playing back such tapes.

About the Dolby HX-Pro headroom extension system

By functioning to improve the maximum output level of the tape's high-frequency range, this system permits recordings without a reduction in the level of the sound source's high-frequency range. In addition, by using the system in parallel with this unit's noise-reduction system, recording and playback with a greatly extended dynamic range is possible.

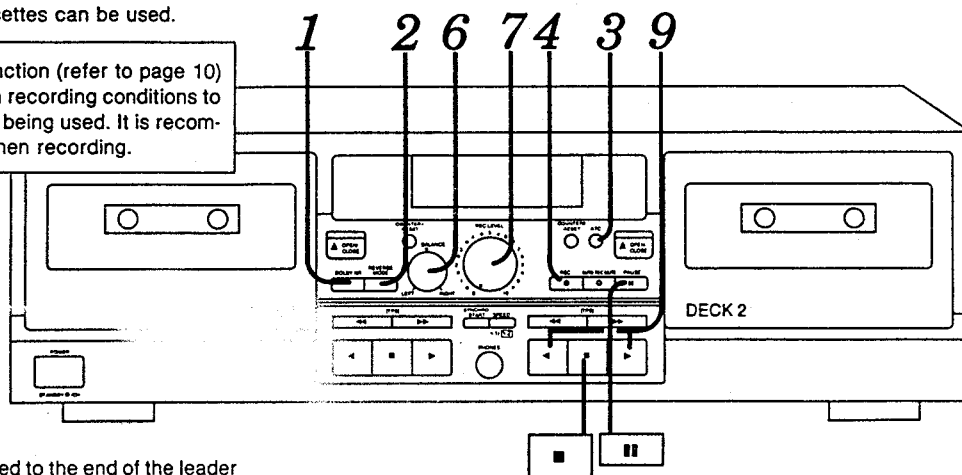
Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

RECORDING (Deck 2 only)

Either normal, CrO₂ or metal type cassettes can be used.

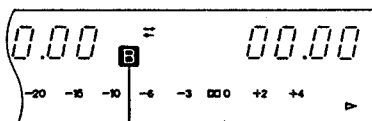
This unit is equipped with an ATC function (refer to page 10) which automatically sets the optimum recording conditions to match the characteristics of the tape being used. It is recommended that you use this function when recording.



Preparation

1. Switch on the power.
2. Load a tape which has been advanced to the end of the leader tape (the transparent part at both ends of the tape) into Deck 2.

1 **DOLBY NR** **Press DOLBY NR to select the desired noise-reduction system.** (Refer to the opposite page.)

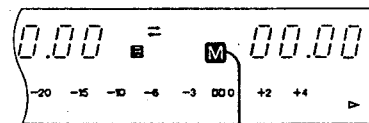


Each time the button is pressed, the indicator will change in the order:

B → **C** → off.

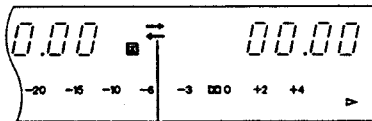
3 **ATC** **Press ATC.**

Setting of the ATC (refer to page 10) will commence, and will be completed after approximately one minute. When the settings are complete, the tape will be returned to the position from which the ATC function began, and then the unit will enter the stop mode.

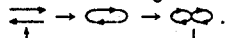


Indicates that ATC has been set.

2 **REVERSE MODE** **Press REVERSE MODE to select the desired reverse mode.**



Each time the button is pressed, the indicator will change in the order:



→ : Only one side will be recorded, and then operation will automatically stop.

↔, ∞ : Both sides (the forward side first, and then the reverse side) will be recorded, and then operation will automatically stop.

4 **REC** **Press REC ●.**

(The unit will be in the recording standby mode.)

Illuminates

Flashes

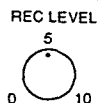
5 **Play the source in order to adjust the recording sound.**

6 **BALANCE** **If necessary, adjust the BALANCE control to adjust the balance.**

(Refer to the opposite page.)

(The control should normally be set to the center position.)

7 Use the REC LEVEL control to adjust the recording level.
(Refer to the right side of this page.)

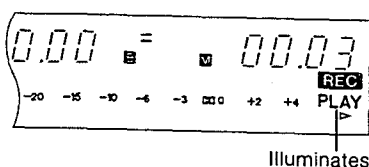


8 Stop play of the source.

9 Press ◀ or ▶ to begin recording, and play the source to be recorded.



- ▶ To begin recording from the forward side.
- ◀ To begin recording from the reverse side.



Note

When recording on both sides of the tape, be sure to press the ▶ button.

When recording without using the ATC function, step 3 is unnecessary.

To temporarily stop recording



Press **||**.

Press once again to resume recording.

To stop recording



Press **■**.

To cancel the ATC settings

[While ATC settings are in progress]



Press **■**.

[After ATC settings have been completed]



Press **ATC**.

If the **M** indicator begins to flash quickly while the ATC settings are in progress, it indicates that the settings cannot be made for one of the following reasons:

About the selection of the Dolby NR type

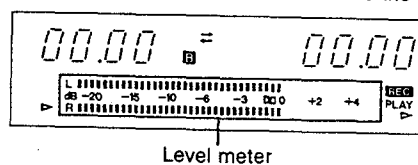
The Dolby NR effect can be obtained by using the same type of Dolby NR during both recording and playback. Refer to the following table when selecting the type (either B or C).

Type B	Use this type when the deck on which the tape will be played back is equipped with only type B Dolby NR.
Type C	Use this type when the deck on which the tape will be played back is equipped with type C Dolby NR. (for example, when this unit is also going to be used to play back the tape.)

(Refer to "About the Dolby noise-reduction system" on page 7.)

About the balance adjustment

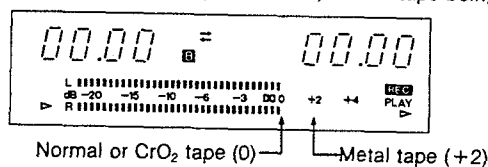
While playing a monaural source, adjust so that the left and right level indications on the level meter are the same.



About the recording level adjustment

If the recording level is too high, there will be distortion in the recorded sounds, and if it is too low, the hiss noise inherent to recording tapes will become noticeable.

In order to make high-quality recordings, use the REC LEVEL control to adjust so that highest values of the input level indicated by the level meter do not exceed the standard recording level (the number indicated in parentheses) for the tape being used.



- The tape has reached the leader tape.
- The tape is severely damaged.
- The cassette deck's heads are severely dirty.
- The tape is a non-standard type, such as a metal tape which has no tape type identification hole in the cassette.

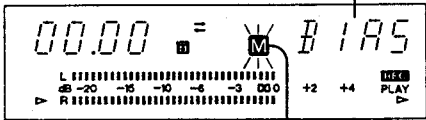
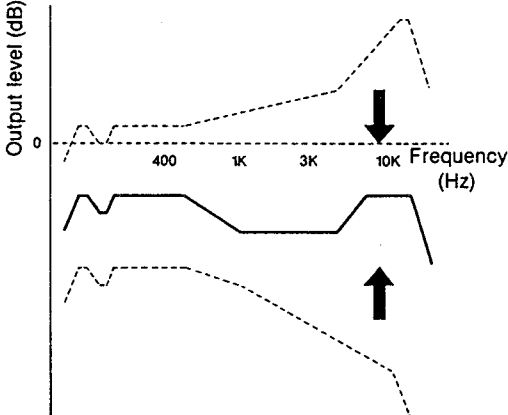
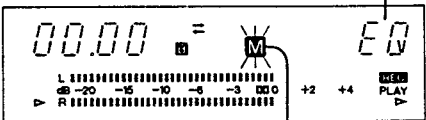
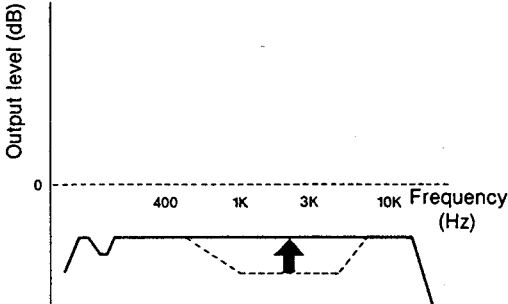
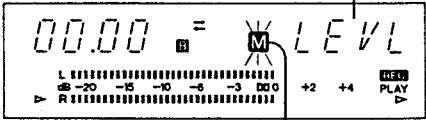
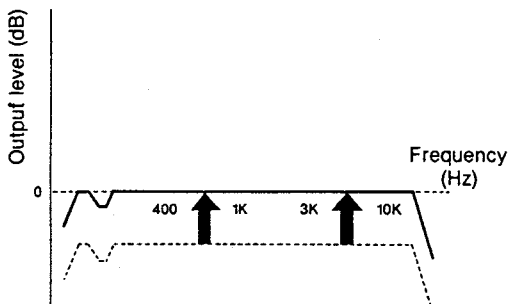
Note

- If the cassette holder is opened after the ATC settings have been completed, the settings will be canceled.
- When making the ATC settings midway along a tape, provide a silent interval at least 2 seconds long after the last track prior to where the settings will begin.

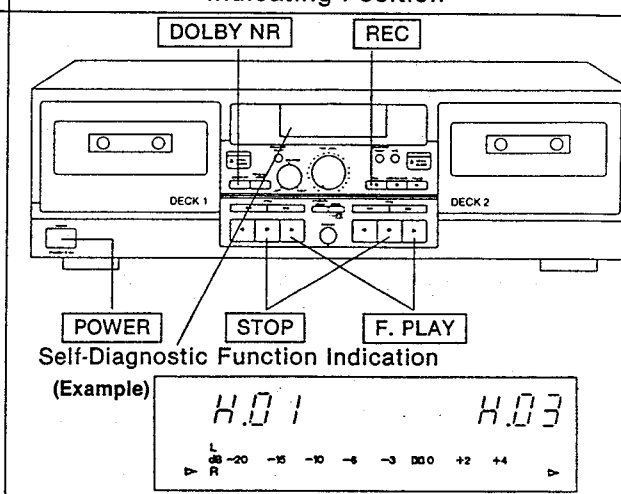
■ ABOUT THE ATC FUNCTION

The ATC (auto tape calibration) function records a test signal in order to automatically set the bias, equalizer and recording/playback level to the optimum recording conditions in accordance with the characteristics of the tape being used.

The table below shows the conditions of the display and the operation of the unit while the ATC settings are being made.

	Display	Unit operation
① Bias adjustment	 <p>"BIAS" is displayed.</p> <p>Flashes</p>	<p>The bias is adjusted so that the output level is the same at 400 Hz and at 10 kHz.</p> 
② Equalizer adjustment	 <p>"EQ" is displayed.</p> <p>Flashes</p>	 <p>The equalizer is adjusted so that the output level is the same at 400 Hz and at 3 kHz.</p>
③ Level adjustment	 <p>"LEVL" is displayed.</p> <p>Flashes</p>	 <p>The tape sensitivity is compensated so that the recording input level and the playback output level are the same.</p>

SELF-DIAGNOSTIC

Indicating Procedure	Indicating Position
<p>To indicate Self-Diagnostic Function</p> <ol style="list-style-type: none"> 1. Check both Deck 1 and 2 are empty (no cassette tape), then turn on the power. 2. Press and hold the DOLBY (NR) button (for more than 3 seconds), and also press the Deck 2 STOP (■) button for about 2 seconds until the level meter changes from constantly lit to blinking. 3. Insert a normal tape for Deck 2, either A or B side of which has the erase preventing piece folded. Then close the cassette holder. 4. Press the Deck 2 F. PLAY (▶) button and play the tape for more than 1 second, then press the STOP (■) button. 5. Insert a normal blank cassette tape for DECK 2, both A and B sides of which have the erase preventing pieces respectively, and close the cassette holder. 6. Press the REC (●) button. This automatically makes Deck 2 perform the following operations. <p>Record an eight second portion with no sound. → Record a 20 second portion off 400Hz test signal.</p> <p>TPS-REVIEW search mode ← Stop the unit</p> <p>(NOTE: The tape has to be taken up by playback for about 1 minute.)</p> <ol style="list-style-type: none"> 7. Insert a normal tape for Deck 1, either A or B side of which has the erase preventing piece folded. Then close the cassette holder. 8. Press the Deck 1 FF (▶▶) button. This automatically makes Deck 1 Perform the following operations. <p>FF mode (approx. 2 second) → REW mode (approx. 2 second) → Stop the unit</p> <ol style="list-style-type: none"> 9. Press the Deck 1 STOP (■) button to display the self-diagnostic results for Deck 1, and press the Deck 2 STOP (■) button to display the results for Deck 2. When a fault occurs in Deck 1 and/or Deck 2, the FL display indicates the results of self-diagnostic tests. For multiple faults, the indication changes each time the STOP (■) button is pressed. 10. If there is no fault, the counter display remains unchanged when the STOP (■) button is pressed. <p>To resume Ordinary Indication</p> <p>To return the display to normal mode, switch the power off and then back on again. To have the indication appear again, take the above-stated steps 1, 2 and 9.</p> <p>NOTE: The contents of the self-diagnostic mode are stored in memory. To clear the memory, press the STOP (■) button on Deck 2 for more than 6 seconds, until "CL" appears in the FL display.</p>	 <p>Self-Diagnostic Function Indication (Example)</p> <p>H01 H03</p> <p>L -20 -15 -10 -5 -3 00 +2 +4 R</p>

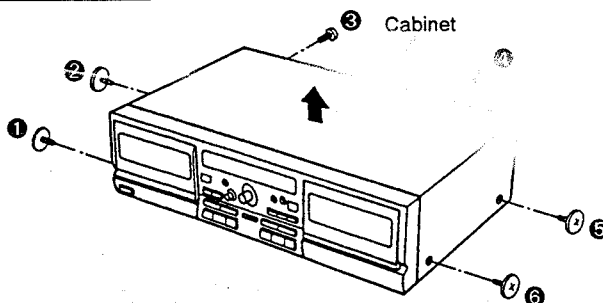
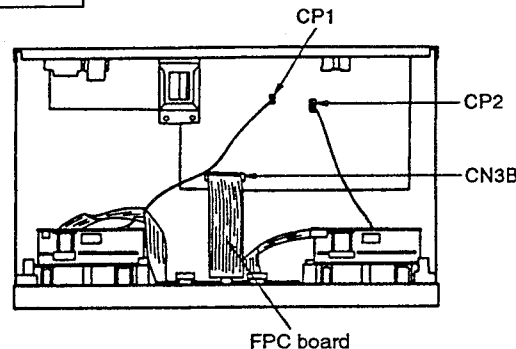
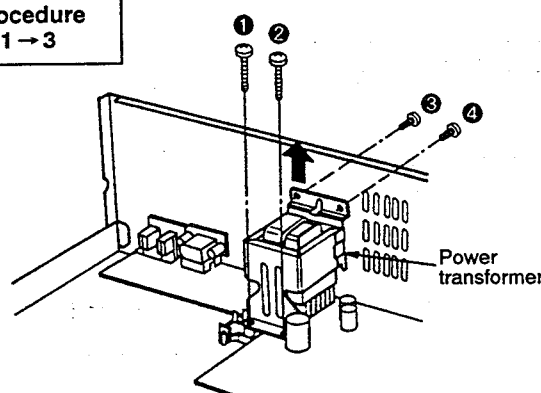
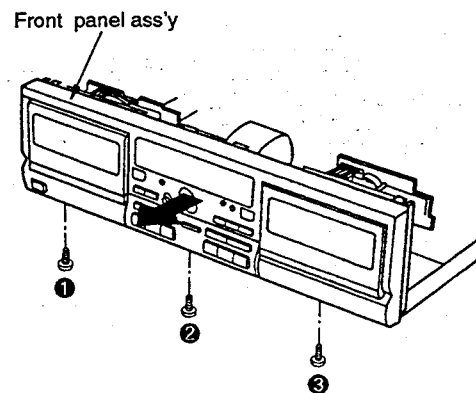
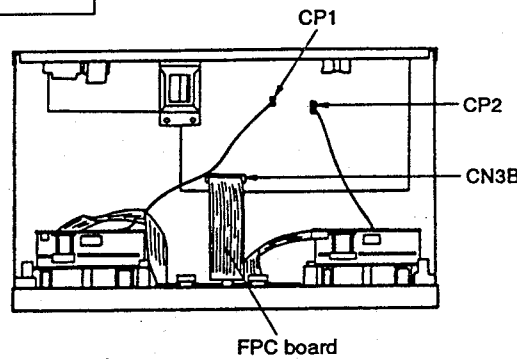
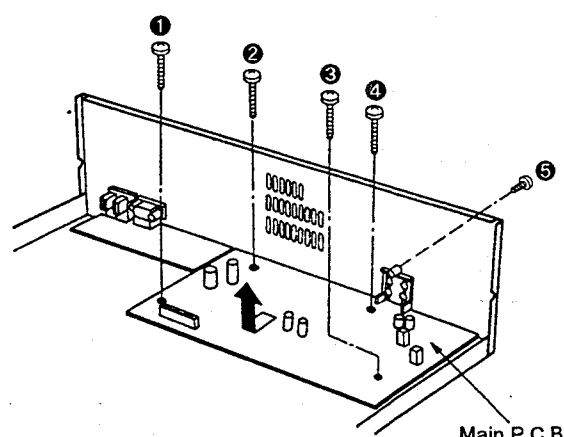
Indication Text

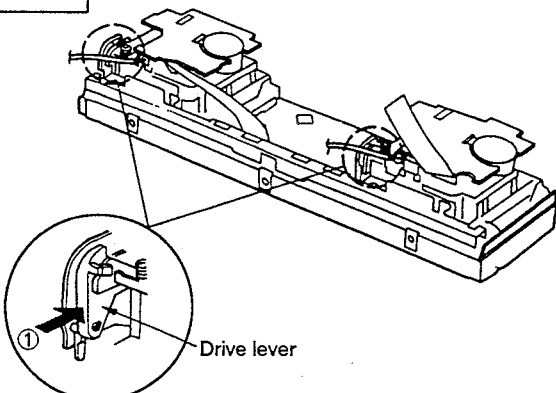
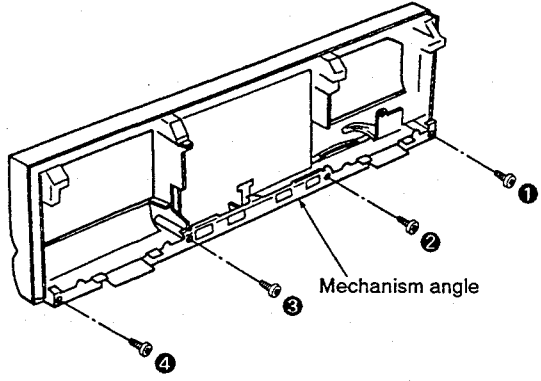
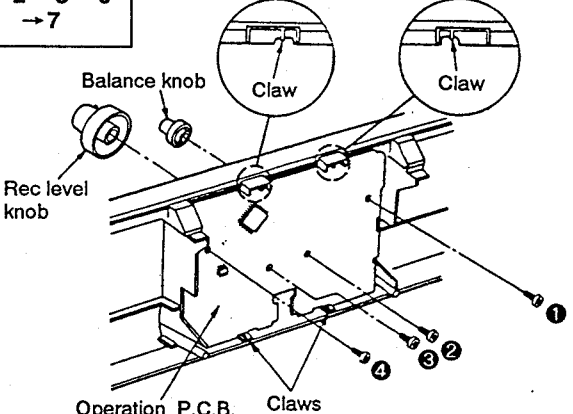
Symbol	Trouble	Remedy
H01	Irregular action of cassette mechanism. (Example) Pressing the FWD PLAY button results in REW PLAY action.	The cassette mechanism mode switch and plunger are defective. (Check and replace them.)
H02	No recording can be made, or the unit is placed in the recording mode though the erase preventing piece has been broken.	The erase preventing switch contacts improperly, or there is a shortcircuit. (Check and replace the switch.)
H03	Pressing the PLAY (▶) button fails to play the tape. Pressing the PLAY (▶) button causes the motor to rotate though no cassette tape is in.	The cassette half detect switch contacts improperly, or there is a shortcircuit. (Check and replace the switch.)
H04	The cassette holder will not open or close when the OPEN/CLOSE (▲) button is pressed.	The cassette holder open/close detect switch contacts improperly, or there is a shortcircuit. (Check and replace the switch.)
H05	Pressing the OPEN/CLOSE (▲) button causes the cassette holder to open after it has closed, and vice versa.	
H06	No treble is produced when a normal tape is played or recorded.	The auto tape select (CrO ₂) switch contacts improperly, or there is a shortcircuit. (Check and replace the switch.)
H07	Excessive treble is produced when a CrO ₂ /Metal tape is played, or the recorded treble is distorted and at a low level.	
F01	When the PLAY (▶) button is pressed, the tape runs a little and stops soon.	The hall IC is defective and, as the result, reel pulse is out of order. (Check and replace the IC.)
F02	TPS dose not operate.	The playback IC is defective. (Check and replace the IC.)

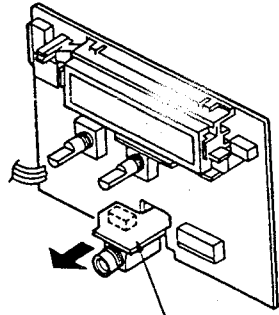
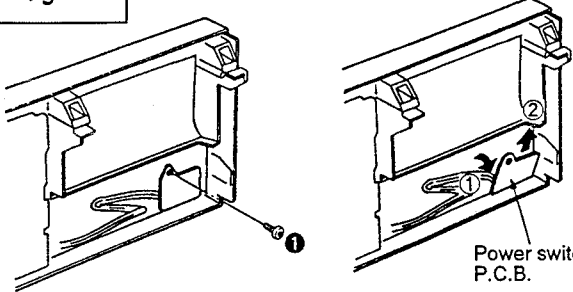
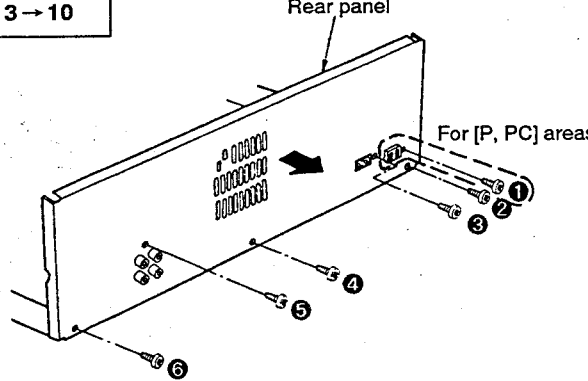
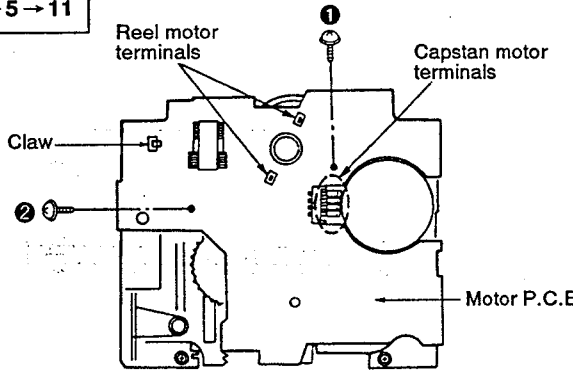
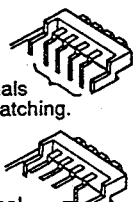
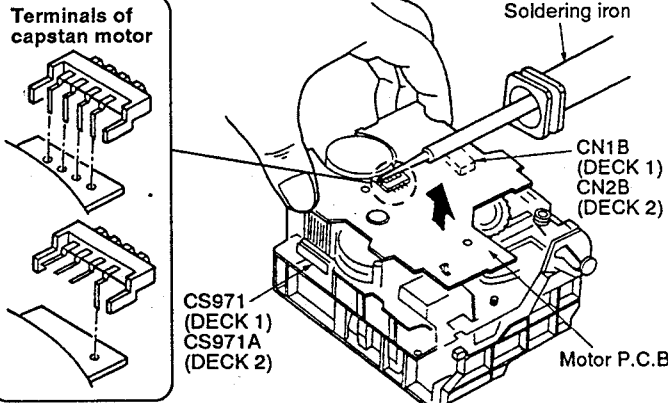
DISASSEMBLY INSTRUCTIONS

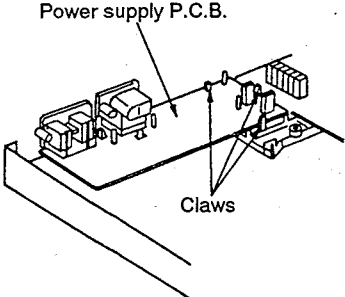
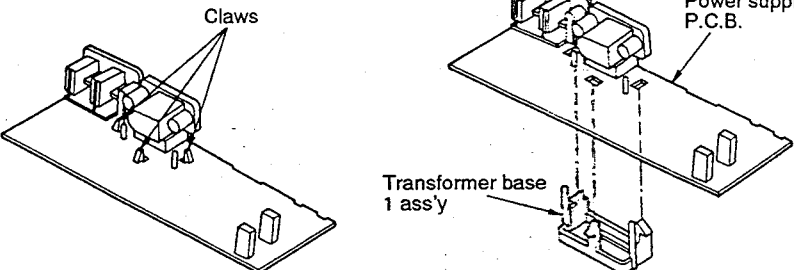
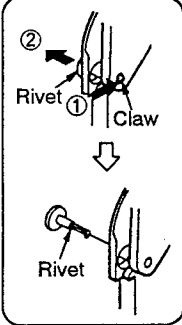
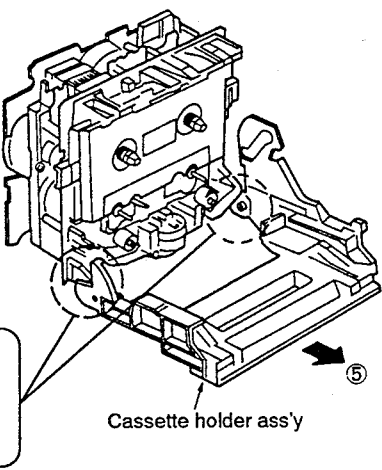
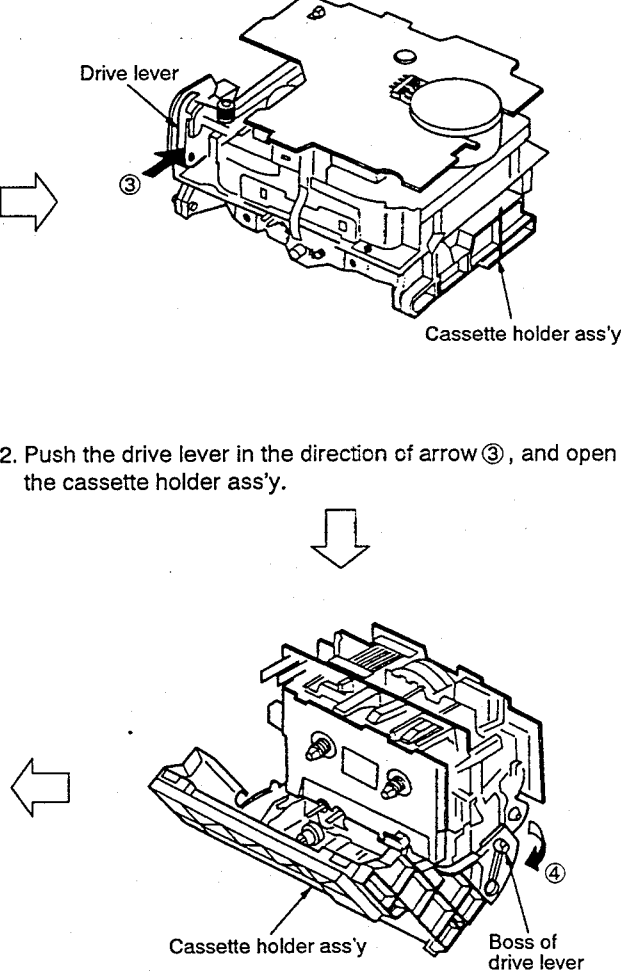
"ATTENTION SERVICER"

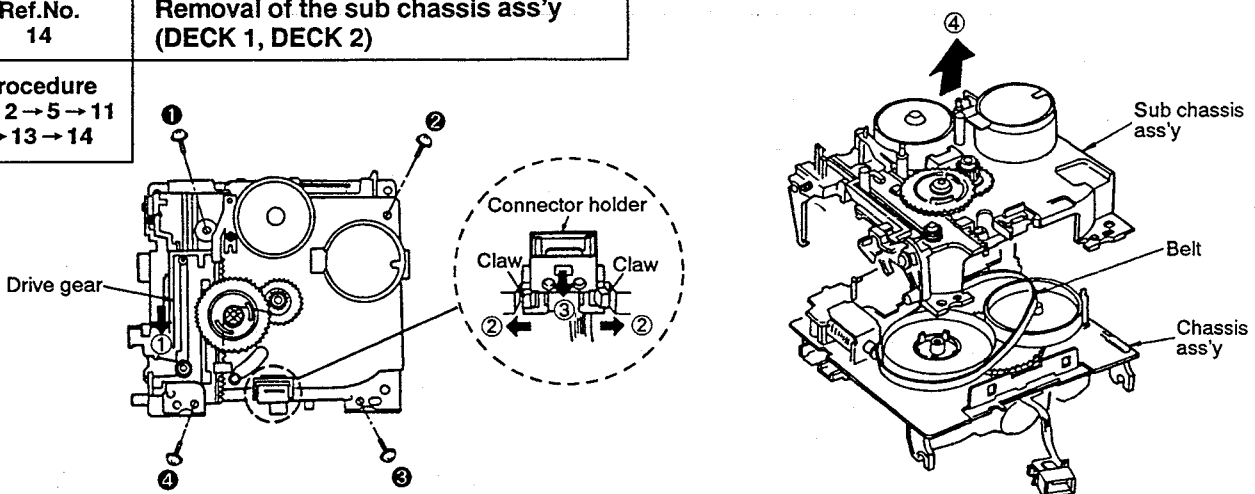
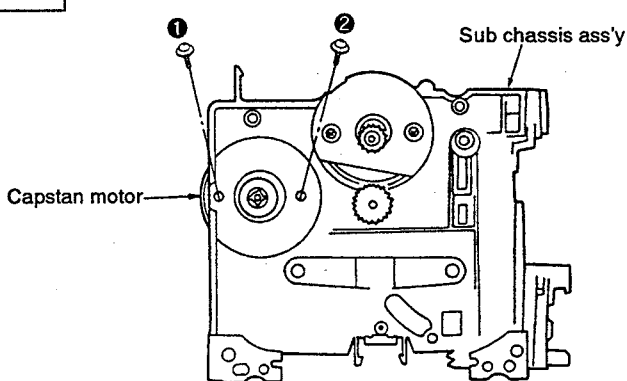
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref.No. 1	Removal of the cabinet	Ref.No. 2	Removal of the front panel ass'y
Procedure 1	 <p>1. Remove the 6 screws(① ~ ⑥). 2. Remove the cabinet in the direction of arrow.</p>	Procedure 1→2	 <p>1. Remove the 2 connectors(CP1, CP2). 2. Pull out the FPC board from connector(CN3B).</p>
Ref.No. 3	Removal of the power transformer		
Procedure 1→3	 <p>1. Remove the 4 screws(① ~ ④). 2. Pull the front power transformer in the direction of arrow.</p>		 <p>3. Remove the 3 screws(① ~ ③). 4. Remove the front panel ass'y in the direction of arrow.</p>
Ref.No. 4	Removal of the main P.C.B.		
Procedure 1→3→4	 <p>1. Remove the 2 connectors(CP1, CP2). 2. Pull out the FPC board from connector(CN3B).</p>		 <p>3. Remove the 5 screws(① ~ ⑤). 4. Remove the main P.C.B. in the direction of arrow.</p>

Ref.No. 5	Removal of the loading cassette mechanism units(DECK 1, DECK 2)	<div data-bbox="172 286 359 358"> Procedure 1 → 2 → 5 </div> <div data-bbox="172 358 853 1395">  <p>1. Push the drive lever in the direction of arrow ①, and open the cassette holder ass'y.</p> <p>2. Lift the cassette lid in the direction of arrow ②, and remove it in the direction of arrow ③.</p> <p>3. Push the drive rack in the direction of arrow ④, and close the cassette holder ass'y.</p> <p>4. Pull out the FPC board from connectors(CN1A, CN2A).</p> <p>5. Remove the 8 screws(① ~ ⑧).</p> </div>	
Ref.No. 6	Removal of the mechanism angle	Ref.No. 7	Removal of the operation P.C.B.
Procedure 1 → 2 → 5 → 6	<div data-bbox="172 1538 853 2040">  <p>• Remove the 4 screws(① ~ ④).</p> </div>	Procedure 1 → 2 → 5 → 6 → 7	<div data-bbox="853 1538 1535 2040">  <p>1. Pull out the rec level knob and balance knob.</p> <p>2. Remove the 4 screws(① ~ ④).</p> <p>3. Release the 4 claws.</p> </div>

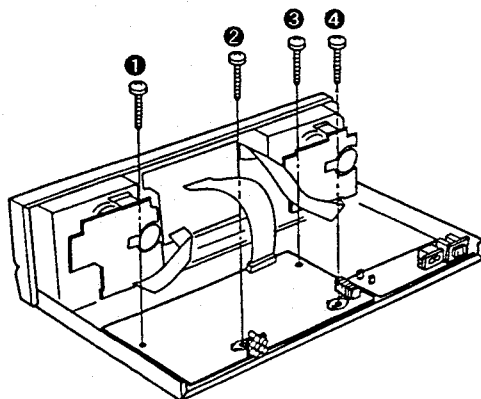
Ref.No. 8	Removal of the headphones jack P.C.B.	Ref.No. 9	Removal of the power switch P.C.B.
Procedure 1 → 2 → 5 → 6 → 7 → 8	<p>※ For [E, EB, EG] areas.</p>  <p>Headphones jack P.C.B.</p> <ul style="list-style-type: none"> Remove the headphones jack P.C.B. in the direction of arrow. 	Procedure 1 → 2 → 5 → 6 → 9	 <p>Power switch P.C.B.</p> <ol style="list-style-type: none"> Remove the 1 screw (①). Tilt the power switch P.C.B. in the direction of arrow ①, and then remove it in the direction of arrow ②.
Ref.No. 10	Removal of the rear panel	Ref.No. 11	Removal of the motor P.C.B. (DECK 1, DECK 2)
Procedure 1 → 3 → 10	 <p>Rear panel</p> <p>For [P, PC] areas.</p> <ol style="list-style-type: none"> Remove the 6 screws (① ~ ⑥). For [P, PC] areas. Remove the 5 screws (② ~ ⑥). For [E, EB, EG] areas. Remove the rear panel in the direction of arrow. 	Procedure 1 → 2 → 5 → 11	 <p>Reel motor terminals</p> <p>Capstan motor terminals</p> <p>Claw</p> <p>Motor P.C.B.</p> <ol style="list-style-type: none"> Remove the 2 screws (①, ②). Unsolder the reel motor and capstan motor terminals. Remove the 1 claw and have the P.C.B. rise a little.
<p>■ The difference types of capstan motor terminal are used for the units. When assembling/reassembling, refer to the Fig. 1 and Fig. 2.</p> <p>※ Notice for mounting the motor P.C.B.</p> <ol style="list-style-type: none"> Cut the bent terminal of capstan motor with a nipper. Solder while pressing the part with a ⊖ screwdriver or an equivalent tool. <div data-bbox="231 1713 790 2004"> <p>Capstan motor terminal</p>  <p>Cut the terminals indicated by hatching.</p> <p>Cut the terminal indicated by hatching.</p> <p>⊖ screwdriver</p> </div> <p>Fig. 2</p>		<div data-bbox="813 1422 1516 1848"> <p>Terminals of capstan motor</p>  <p>Soldering iron</p> <p>CN1B (DECK 1)</p> <p>CN2B (DECK 2)</p> <p>CS971 (DECK 1)</p> <p>CS971A (DECK 2)</p> <p>Motor P.C.B.</p> <p>Fig. 1</p> </div> <ol style="list-style-type: none"> Putting a soldering iron securely on the capstan motor terminal and raising the motor P.C.B. in the direction of arrow, unsolder connected part. <p>Note) When removing the motor P.C.B., pull out the P.C.B. severely because the connectors (CN1B, CN2B, CS971, CS971A) are connected.</p>	

Ref.No. 12	Removal of the power supply P.C.B.
Procedure 1 → 3 → 10 → 12	
	 <ol style="list-style-type: none"> 1. Release the 3 claws, and then remove the power supply P.C.B. 2. Release the 3 claws, and then remove the transformer base 1 ass'y.
Ref.No. 13	Removal of the cassette holder ass'y (DECK 1, DECK 2)
Procedure 1 → 2 → 5 → 13	
  <p>Fig. 1</p>	 <ol style="list-style-type: none"> 1. Pull out the rivet in the direction of arrow ②, while pressing the claw in the direction of arrow ①. 2. Push the drive lever in the direction of arrow ③, and open the cassette holder ass'y. 3. Operate the cassette holder ass'y in the direction of arrow ④, and then remove it from the boss of drive lever. 4. Open the cassette holder ass'y so that the rib of the cassette holder ass'y is located to the position as shown in Fig.1, and then pull out it in the direction of arrow ⑤.

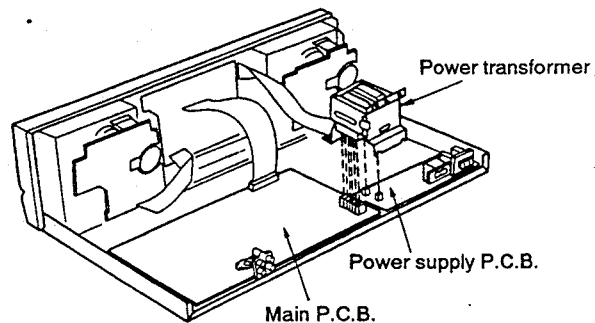
Ref.No. 14	Removal of the sub chassis ass'y (DECK 1, DECK 2)	 <p>1. Push the drive gear in the direction of arrow ①.</p> <p>2. Remove the 4 screws (① ~ ④).</p> <p>3. Release the 2 claws in the direction of arrow ②, and then remove the connector holder in the direction of arrow ③.</p> <p>4. Remove the sub chassis ass'y in the direction of arrow ④.</p> <p>5. Remove the belt.</p> <p>Note: Care must be taken to remove the sub chassis ass'y with tweezers that the belt is not applied with grease.</p>
Procedure 1 → 2 → 5 → 11 → 13 → 14		
Ref.No. 15	Removal of the capstan motor (DECK 1, DECK 2)	 <p>• Remove the 2 screws (①, ②).</p>
Procedure 1 → 2 → 5 → 11 → 13 → 14 → 15		

■ HOW TO CHECK THE MAIN P.C.B.

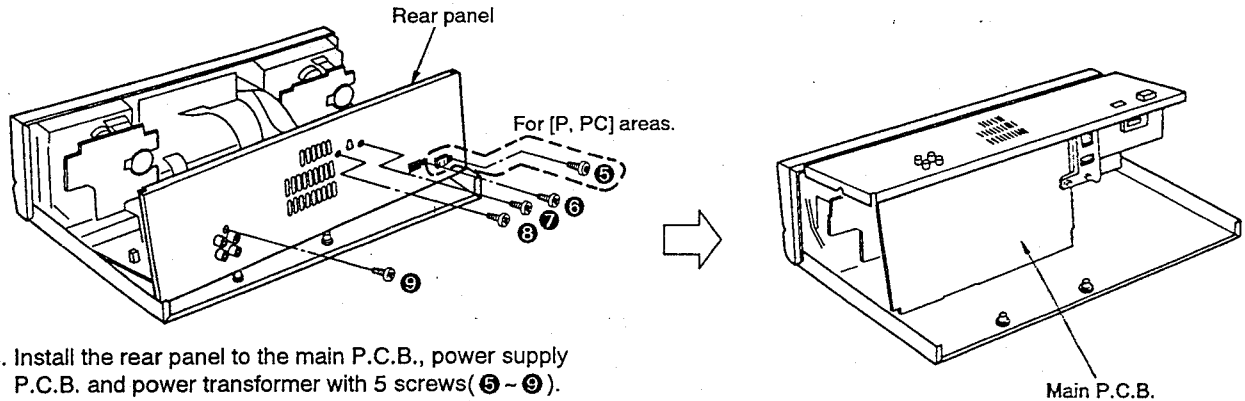
1. Remove the cabinet. (See Ref. No.1 of the disassembly instructions.)
2. Remove the power transformer. (See Ref. No.3 of the disassembly instructions.)
3. Remove the rear panel. (See Ref. No.10 of the disassembly instructions.)



4. Remove the 4 screws (① ~ ④).



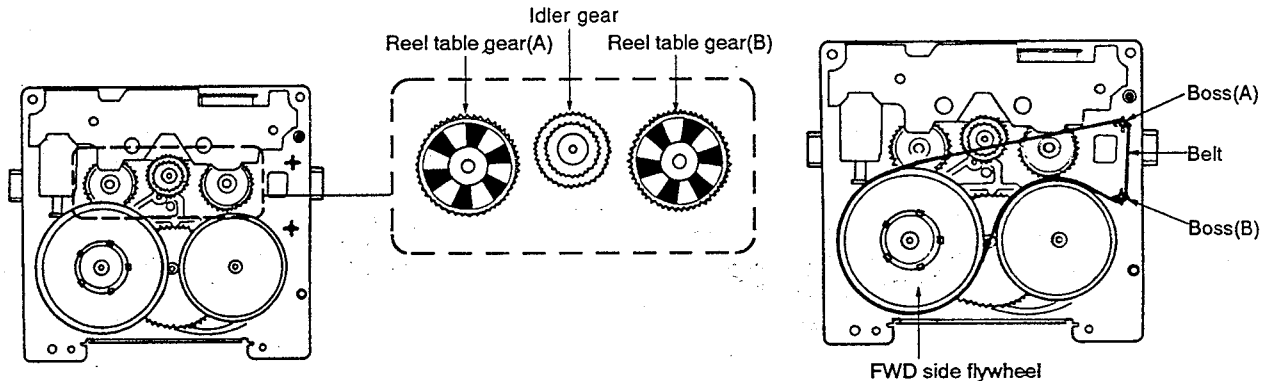
5. Install the power transformer on the main P.C.B. and power supply P.C.B.



6. Install the rear panel to the main P.C.B., power supply P.C.B. and power transformer with 5 screws (5 ~ 9). For [P, PC] areas.
7. Install the rear panel to the main P.C.B., power supply P.C.B. and power transformer with 4 screws (6 ~ 9). For [E, EB, EG] areas.

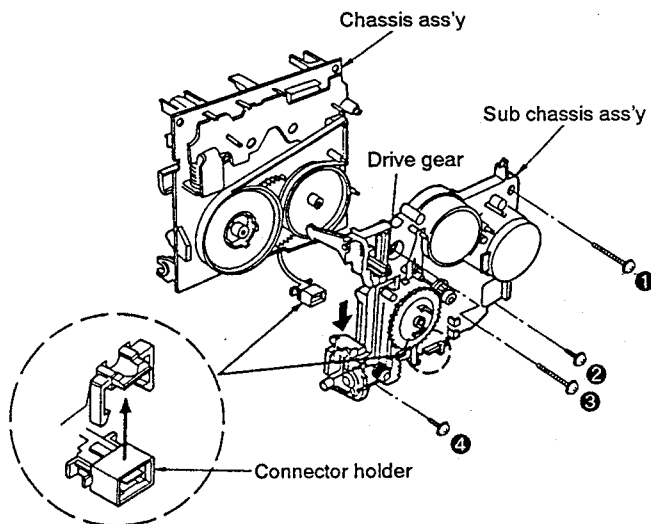
8. When checking the solder surfaces of main P.C.B. and replacing the parts, do as show.

■ INSTALLATION OF THE SUB CHASSIS ASS'Y

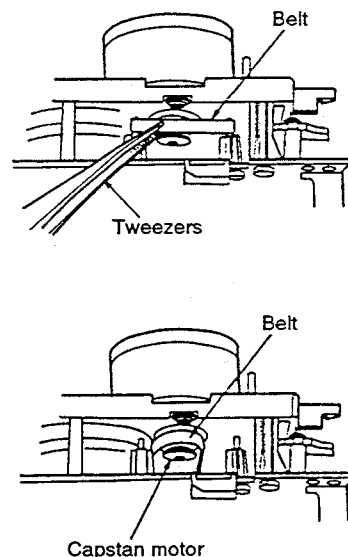


1. Position the idler gear in the between reel table gear (A) and (B). (Mechanism stop position)

2. Temporarily install the belt to the FWD side flywheel, boss(A) and boss(B).
Note: Care must be taken to install the belt with tweezers that the belt is not applied with grease.



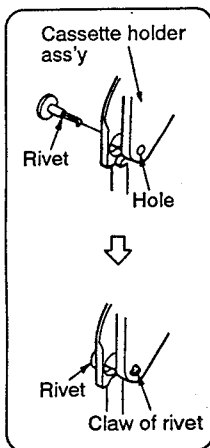
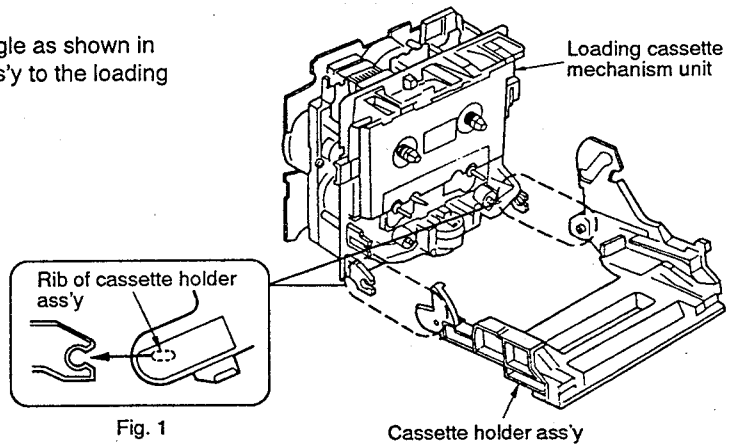
3. Push the drive gear in the direction of arrow.
4. Install the sub chassis ass'y to the chassis ass'y with 4 screws (1 ~ 4).
5. Install the connector holder.



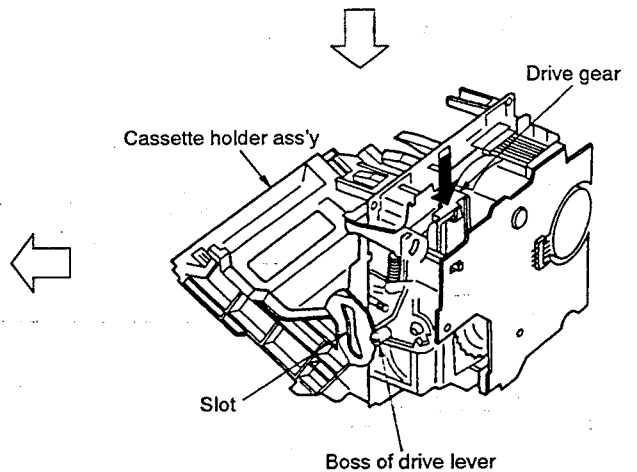
6. Install the belt to the capstan motor using the tweezers.

■ INSTALLATION OF THE CASSETTE HOLDER ASS'Y

1. Tilt the rib of cassette holder ass'y at the angle as shown in Fig.1, and then force the cassette holder ass'y to the loading cassette mechanism unit.



4. Insert the rivet to the hole of cassette holder ass'y.
※ Make sure the claw of rivet is positioned in the hole.



2. Push the drive gear in the direction of arrow.
3. Align the boss of drive lever with the slot of cassette holder ass'y.

■ WRITING TO EEPROM

This unit is equipped with EEPROM memory that stores a variety of design data and performance data such as playback gain, bias value, recording gain, recording equalization, etc., which was programmed at the factory.

This EEPROM memory is capable of being read and written to more than 100,000 times. To illustrate this, if one ATC operation is performed every hour continuously every day for ten years, it would still be possible to successfully read and write with the EEPROM.

Data is actually written in this EEPROM only when ATC is actuated or when power supply is turned on or off.

Since it hardly breaks down, there will scarcely occur such a trouble as to require replacement.

Measurement Condition

- Recording-level control; Maximum
- Recording-balance control; Center
- Reverse-mode selector switch; \rightleftharpoons
- Tape-to-tape recording-speed switch; Off
- Dolby NR switch; Off
- ATC switch; Off
- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)

Measuring instrument

- EVM (Electronic Voltmeter)
- Oscilloscope
- AF oscillator
- ATT (Attenuator)
- Resistor (600Ω)

NOTE: Before adjustment, be sure to set the AF oscillator output level to 0dB (1kHz): 1V

Test tape

- Playback gain adjustment (315Hz, 0dB); QZZCFM
- Overall gain adjustment and Overall frequency response
- Normal reference blank tape; QZZCRA
- CrO₂ reference blank tape; QZZCRX1
- Metal reference blank tape; QZZCRZ5

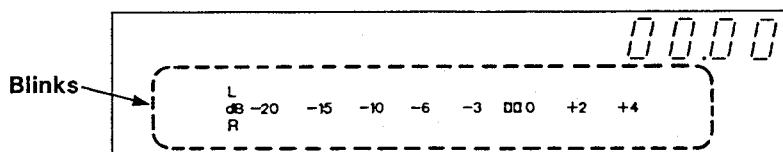
NOTE: Step 1 to step 7 only has to be done after exchange of the EEPROM.

Step 1 Short the Test Mode terminals with a shorting clip.

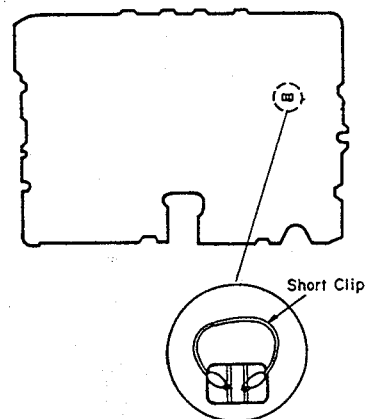
Step 2 While holding down the STOP button on DECK2, press the POWER switch to ON.

Step 3

All FL display segments except for the four-digit counter on DECK2 will start blinking to indicate that the deck has entered Write mode. At this point the four-digit counter will indicate "00*".



OPERATION P.C.B.



Notes:

- The test mode terminals on main P.C.B. should be shorted with a short clip as shown above figure.
- After the adjustment items disconnect the short clip.

Step 4

The counter shows a four-digit hex number. The two high-order digits indicate a ROM address, and the two low-order digits indicate the data stored at that address.

Step 5

00 00
H L
I O

Set these digits using the FF or REW button.

The high- and low-order digits of the address increment alternately each time the FF button is pressed. The REW button causes these digits to decrement alternately.

For fast incrementing or decrementing, hold down the FF or REW button.

Set these digits using the F. PLAY or R. PLAY button. The high- and low-order digits of the data increment alternately each time the F. PLAY button is pressed. The R. PLAY button causes these digits to decrement alternately. For fast incrementing or decrementing, hold down the F. PLAY or R. PLAY button.

Example: Set "FF" in address 03 (see Fig. 3).

03 5A

Set these digits to "5A" using the F. PLAY or R. PALY button.

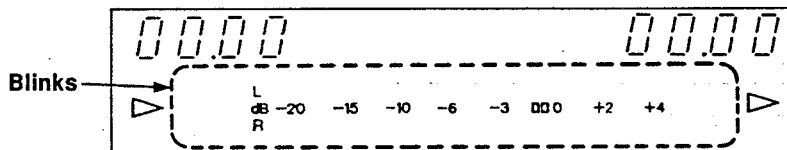
Set these digits to "03" using the FF or REW button.

Step 6

Begin from address 00 and write data up to address 7F (data in). Check that the data at address 7F is "00" (end), and then exit the write mode.

Step 7

After completing ROM writing, press the STOP button on DECK2 to restore the normal Test mode. The four-digit counter on DECK1 displays.



PLAYBACK GAIN

Step 8

- Set the AF oscillator's output frequency to 315Hz/-20dB (100mV) (see Fig. 2).
- With no tape loaded in the deck, press and hold the REC button. Adjust the test signal level using the Rec. Level and Balance controls until the line output levels on both channels are 320mV. When the adjustment is complete, release the REC button. (The deck stores the data at the moment the REC button is released.)
- Load the test tape, QZZCFM, into the deck and locate the section of the tape where the playback gain test tone (315Hz, 0dB) is recorded, then playback the portion. Press the ATC button, and the display will flash **M** slowly, meaning that playback gain is being automatically adjusted. Press the play button. (At this point the deck automatically adjusts playback gains.) After this play back the tape and verify that the output level falls in the specified range.

Standard value: 320mV ± 0.5 dB

Note: If adjustment of PLAYBACK GAIN fails, the display will flash **M** rapidly. After a successful adjustment, the display will no longer show **M**.

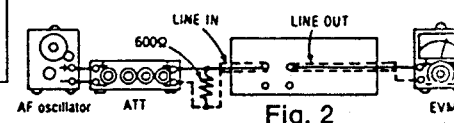


Fig. 2

INITIAL SETTING UP FOR OVERALL GAIN AND OVERALL FREQUENCY RESPONSE

E

Step 9

- Load a Normal blank test tape (QZZCRV2) into the deck under test. Press the ATC button, then the REC button. The display will flash **M** slowly. (At this point the deck automatically adjusts the overall gain and frequency response.)
 - After the above setting, the overall gain for selection of CrO₂ and Metal tape will be automatically set by the ROM and stored in the ROM.
- Note:** If adjustment of OVERALL GAIN or OVERALL FREQUENCY RESPONSE fails, the display will flash **M** rapidly. After a successful adjustment, the display will no longer show **M**.

Step 10

Remove the shorting clip from the Test Mode terminals. The FL display will stop blinking.

Note: If the microprocessor is replaced, it is not necessary to replace (or write data to) the EEPROM.

• EEPROM MAP

Low \ High	0	1	2	3	4	5	6	7
0	00	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—
3	5A	—	—	—	—	—	—	—
4	—	—	—	—	—	68	84	90
5	—	—	—	—	—	78	60	60
6	—	—	—	—	—	38	30	18
7	—	—	—	—	—	64	68	78
8	—	—	—	—	—	A8	B0	8C
9	—	—	9A	AA	94	50	70	68
A	—	—	6A	0F	—	80	80	80
B	—	—	70	2B	—	40	50	A0
C	—	—	50	12	—	B8	B4	B8
D	—	—	72	07	—	66	5E	40
E	—	—	4C	FB	—	70	74	02
F	—	—	55	F5	—	47	47	00

Fig. 3

Note: At an address with no data value indicated (e.g. 01 → —), the ROM operates normally irrespective of the kind of the data supplied.

■ MEASUREMENTS AND ADJUSTMENTS

Measurement Condition

- Recording-level control; Maximum
- Recording-balance control; Center
- Reverse-mode selector switch; \rightleftharpoons
- Tape-to-tape recording-speed switch; Off
- Dolby NR switch; Off
- ATC switch; Off

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)

Measuring instrument

- EVM (Electro Voltmeter)
- Oscilloscope
- Digital frequency counter
- AF oscillator

- ATT (Attenuator)
- DC voltmeter
- Resistor (600Ω)

NOTE: Before adjustment, be sure to set the AF oscillator output level to 0dB (1kHz): 1V

Test tape

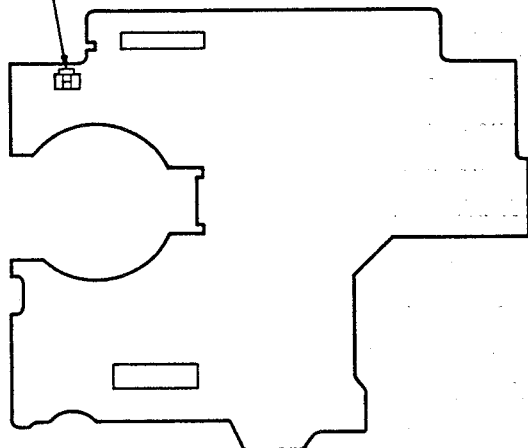
- Head azimuth adjustment (8kHz, -20dB)
- Playback frequency response (315Hz, 12.5kHz, 10kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, 63Hz, -20dB) ; QZZCFM
- Playback gain adjustment (315Hz, 0dB)

- Tape speed adjustment (3kHz, -10dB); QZZCWAT
- Overall gain adjustment and Overall frequency response
Normal reference blank tape; QZZCRA
CrO₂ reference blank tape; QZZCRX1
Metal reference blank tape; QZZCRZ5

• Adjustment Points

Tape speed
(DECK 1)
VR801

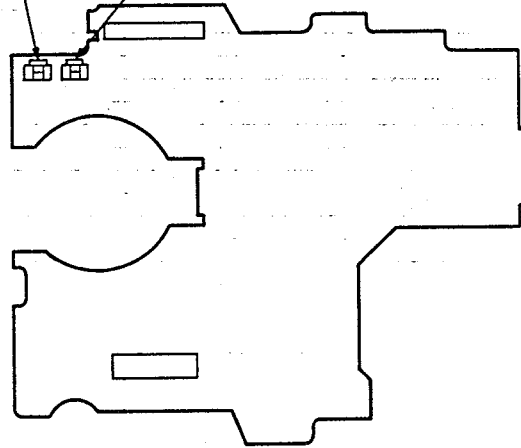
MOTOR P.C.B. (DECK 1)



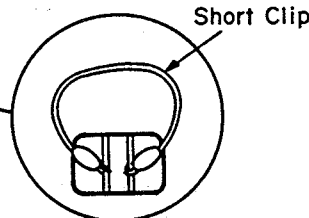
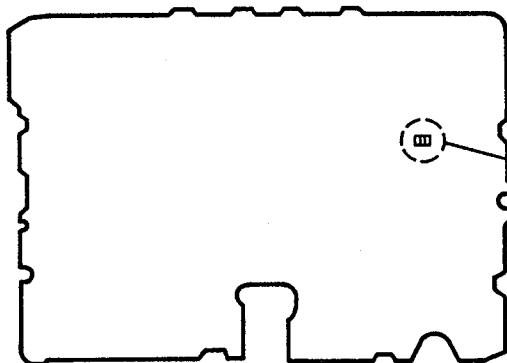
Tape speed
(DECK 2: High)
VR802

Tape speed
(DECK 2)
VR803

MOTOR P.C.B. (DECK 2)



OPERATION P.C.B.

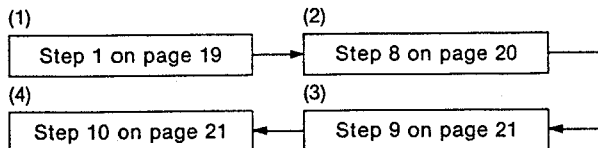


Notes:

- The test mode terminals on mechanism control P.C.B. should be shorted with a short clip as shown above figure.
- After the adjustment items disconnect the short clip.

HEAD REPLACEMENT

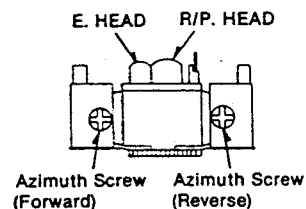
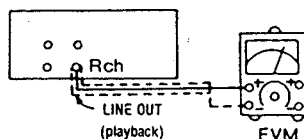
When replacing the R/P head or E head, adjust the head azimuth (erase head with small screw stop does not need adjustment) then start the EEPROM adjustment in the following sequence.



(The adjustment is necessary because the playback gain, the overall gain, and the overall frequency response are changed by the head replacement.)

HEAD AZIMUTH ADJUSTMENT (DECK 1/2)

1. Playback the azimuth adjustment portion (8kHz, -20dB) of the test tape (QZZCFM). Vary the azimuth adjusting screw until the output of the R-CH are maximized.
2. Perform the same adjustment in the play mode.
3. Repeat the same check in reverse play mode.
4. After the adjustment, apply screwlock to the azimuth adjusting screw.

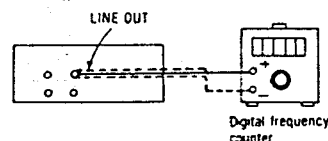


TAPE SPEED ADJUSTMENT (DECK 1/2)

Normal speed

1. Playback the middle portion of the test tape (QZZCWAT).
2. Short the test terminal.
3. Adjust Deck 1=VR801 and Deck 2=VR803 so that the output is within the standard value.

Standard value: 3000 ± 15 Hz (NORMAL speed)



High speed [Set the unit to forward (FWD) mode.]

4. Press the tape-to-tape recording-speed selector switch (X2) button. This will set the high speed mode.
5. Playback the middle portion on the test tape (QZZCWAT).
6. At that time, check if the output from DECK 1 is within the standard value.

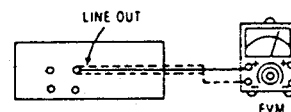
Standard value: 6000 ± 600 Hz (HIGH speed)

7. Adjust VR802 so that the output frequency of DECK 2 is within ±30 Hz for the value of the output frequency of DECK 1.
8. Release the test terminal.

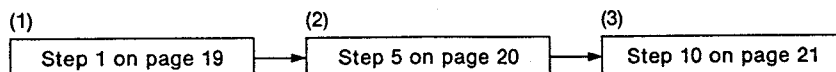
PLAYBACK GAIN MEASUREMENT (DECK 1/2)

1. Load the test tape (QZZCFM) into the deck and locate the part where the playback gain test tone (315Hz, 0dB) is recorded. After this, play back the tape and verify that the output level falls in the specified range.

Standard value: 320 mV ± 0.5 dB



2. If outside the standard value, data in EEPROM should be written again by taking the following procedure and there thereafter section 1 should be carried out again.



PLAYBACK FREQUENCY RESPONSE (DECK 1/2)

1. Playback the frequency response portion (315Hz, 12.5kHz~63Hz, -20dB) of the test tape (QZZCFM).
2. Assure that the frequency response is within the range shown in Fig. 4 for both L-CH and R-CH.

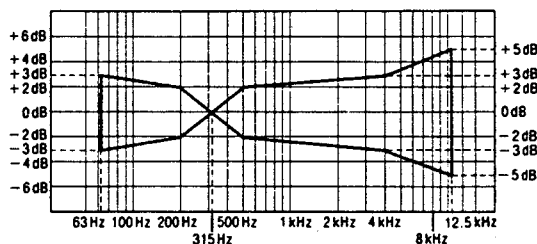
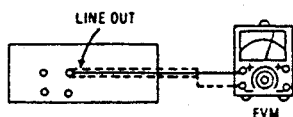
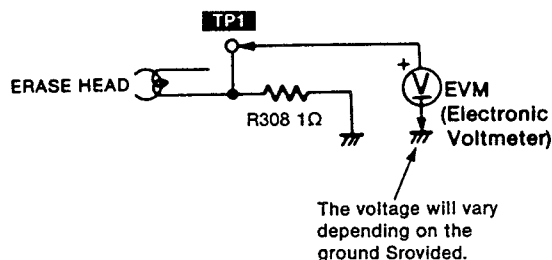


Fig. 4

ERASE CURRENT ADJUSTMENT

1. With no tape loaded in the deck, press the Record button.
2. Check if the output at this time between the erase current confirmation point TP1 and GND (chassis) is within the standard value.

Standard value: 175 ± 15 mA (Metal)
EVM Reading: L303 case \rightarrow TP1 175 ± 15 mV

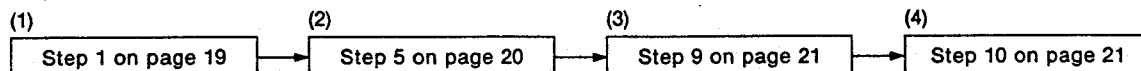


CONFIRMATION OF THE OVERALL GAIN AND OVERALL FREQUENCY RESPONSE

1. In the Record Pause mode, load a normal blank tape (QZZCRV) into the deck, and apply the reference input signal (1kHz, -24dB) to the Rec. input. Adjust the output to 320mV with the attenuator, and start recording.
2. While playing back the reference signal just recorded, verify that the output level falls in the following range.

Standard value: $320 \text{ mV} \pm 0.5 \text{ dB}$

3. Afterward, apply a signal (frequency at the measured point in the range from 50 Hz to 10kHz), whose level is 20dB lower than the reference signal level (1kHz, -24dB=approx. 63mV), to the Rec. input. Then start recording with a normal blank tape (QZZCRA).
4. Play back the test signals just recorded and verify that the levels at the test frequencies fall in the ranges specified in Fig. 5 with respect to the reference signal level.
5. Repeat steps 3 and 4 above for CrO₂ blank test tape (QZZCRX1) and Metal blank test tape (QZZCRZ5), in these cases raising the upper end of the test signal frequency range to 12.5kHz. Verify that the signal levels at the test frequencies fall in the ranges specified in Fig. 6 with respect to the reference signal level.
6. If outside the standard value, data in EEPROM should be written again by taking the following procedure and thereafter section 1-5 should be carried out again.



Normal Overall frequency response chart (NR OUT)

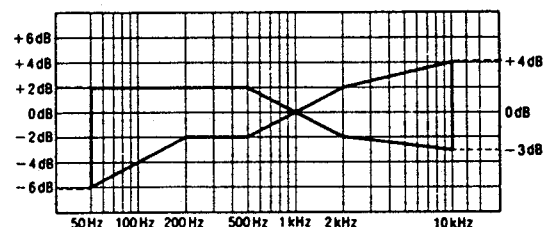


Fig. 5

CrO₂ Metal Overall frequency response chart (NR OUT)

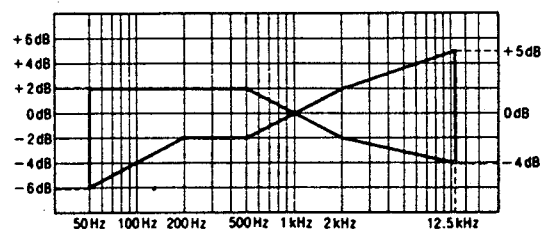
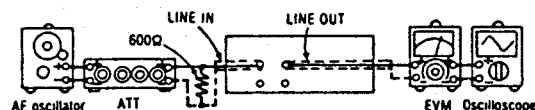
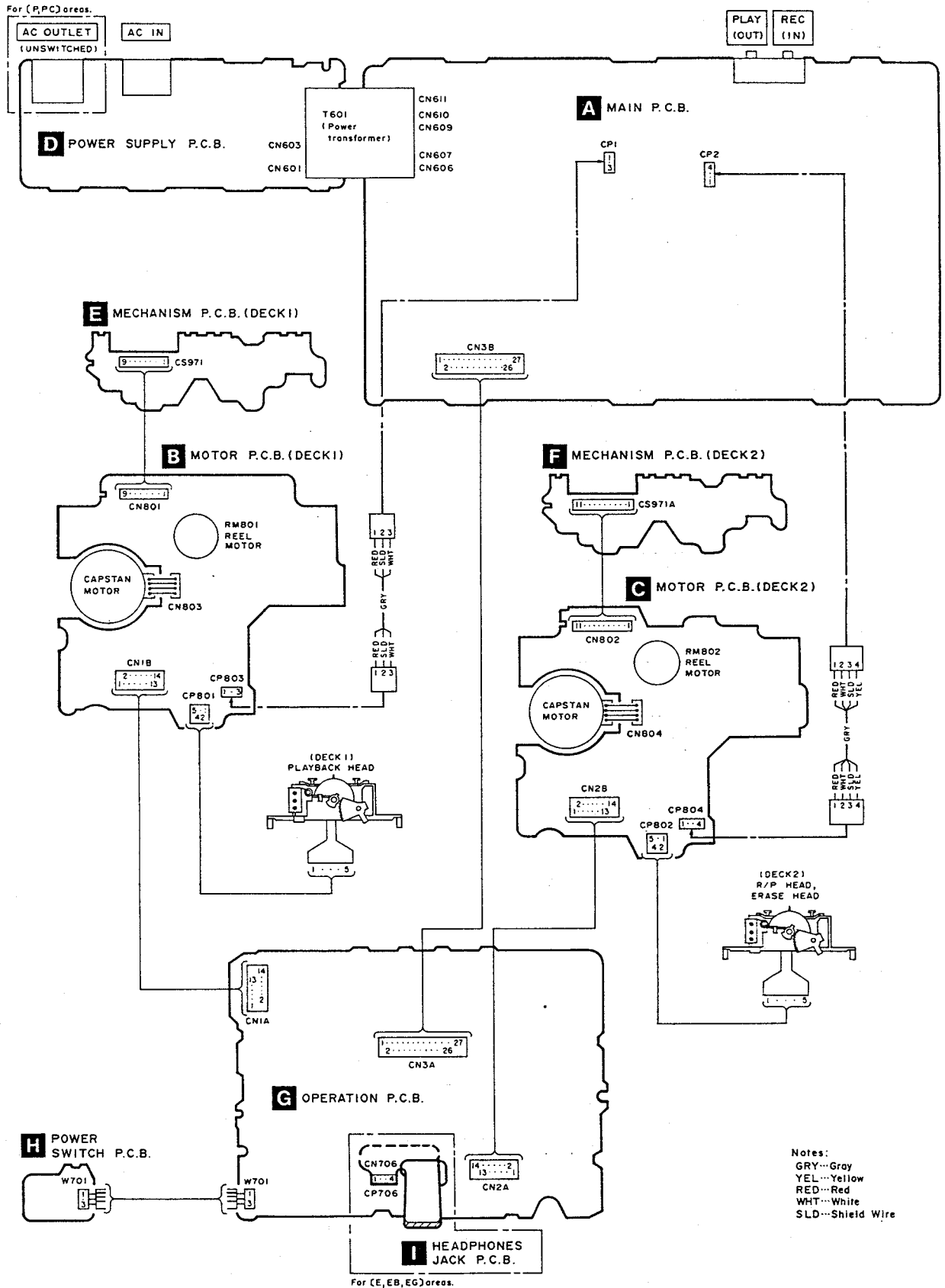


Fig. 6

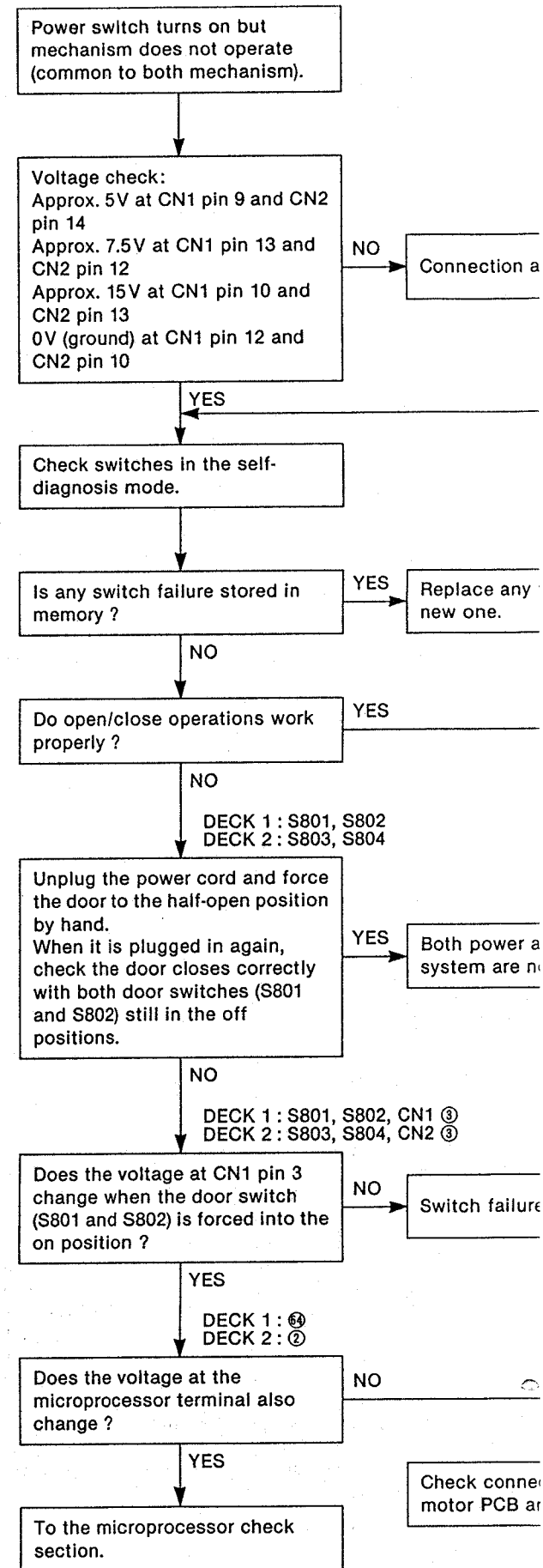
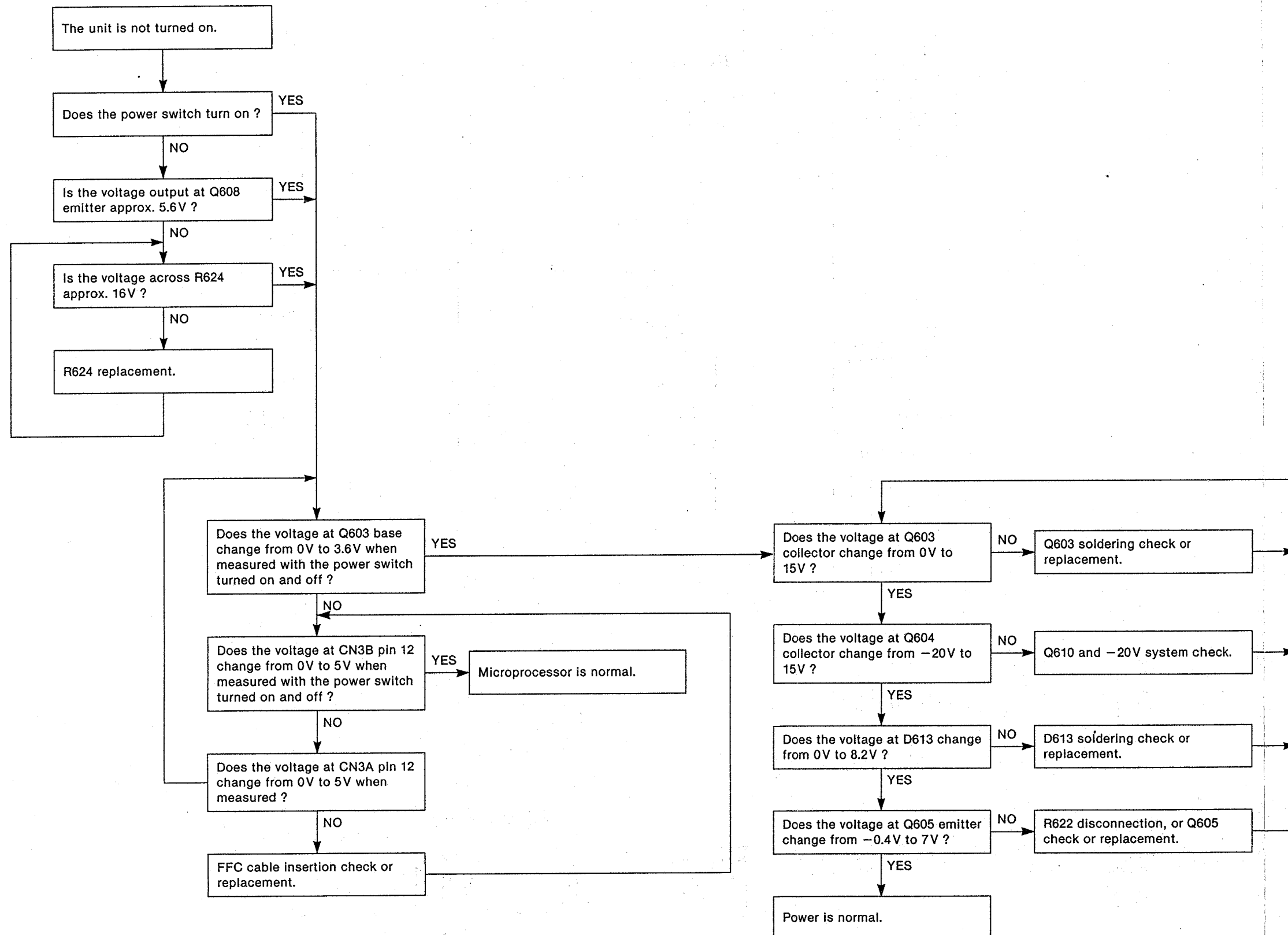


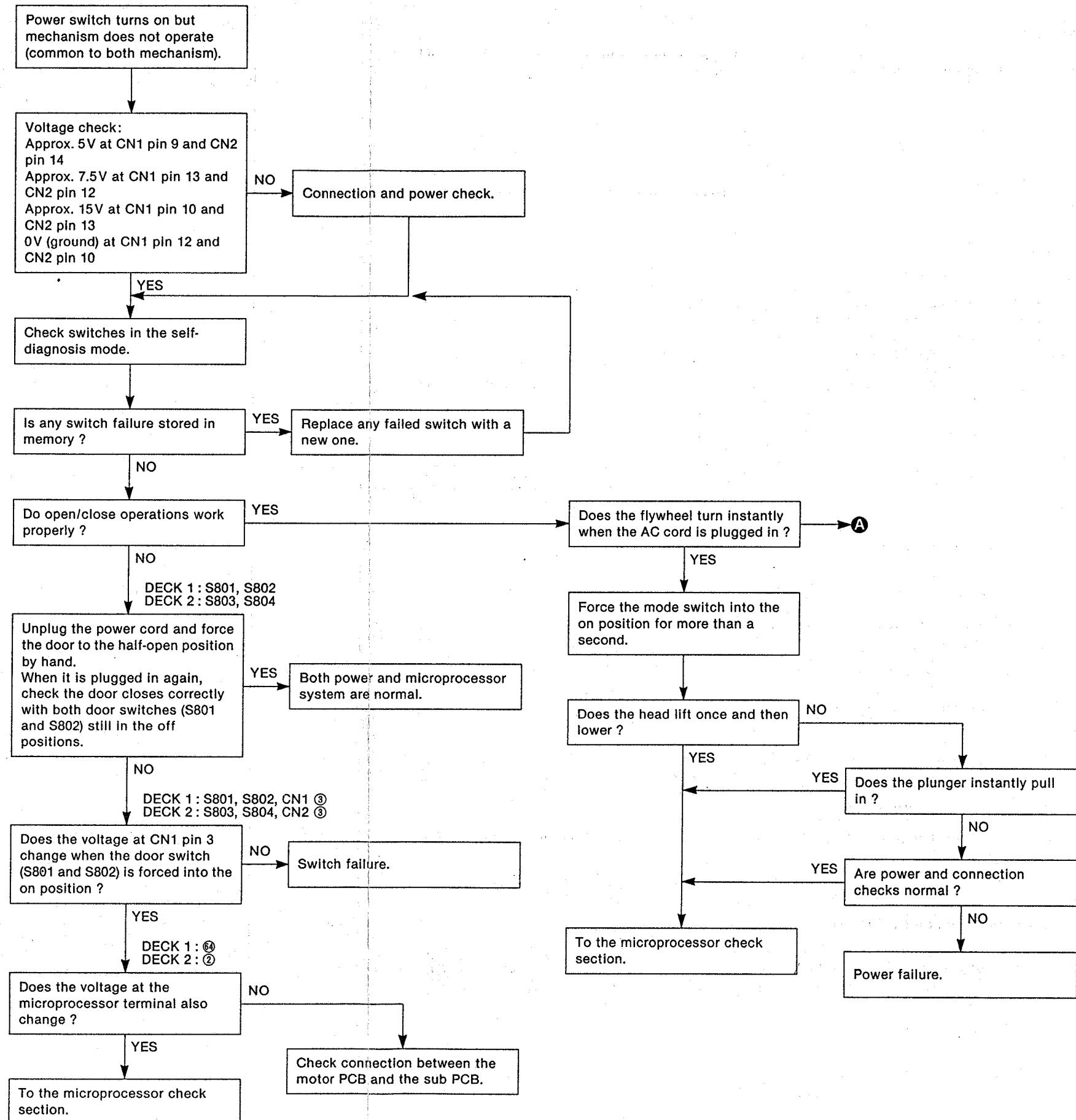
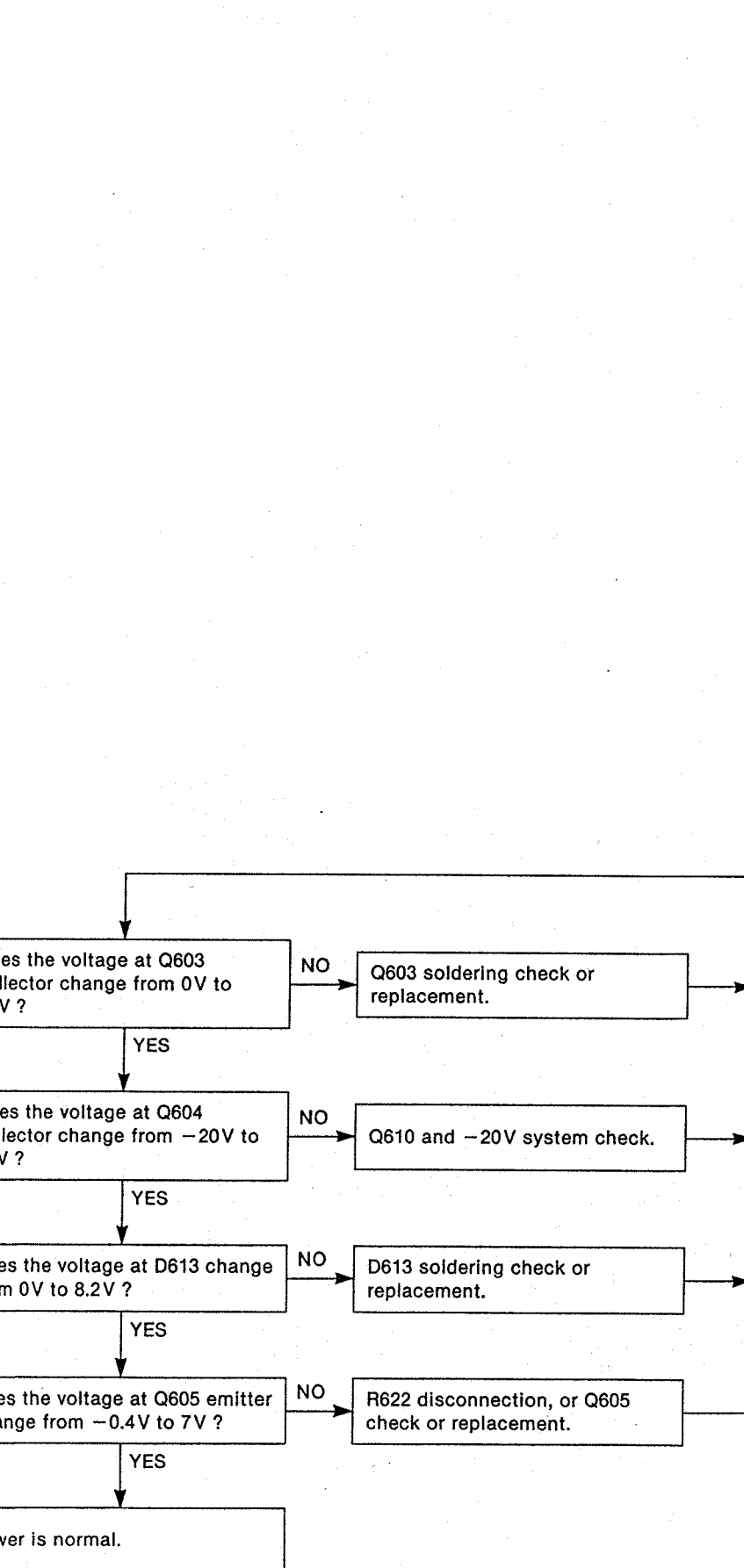
WIRING CONNECTION DIAGRAM

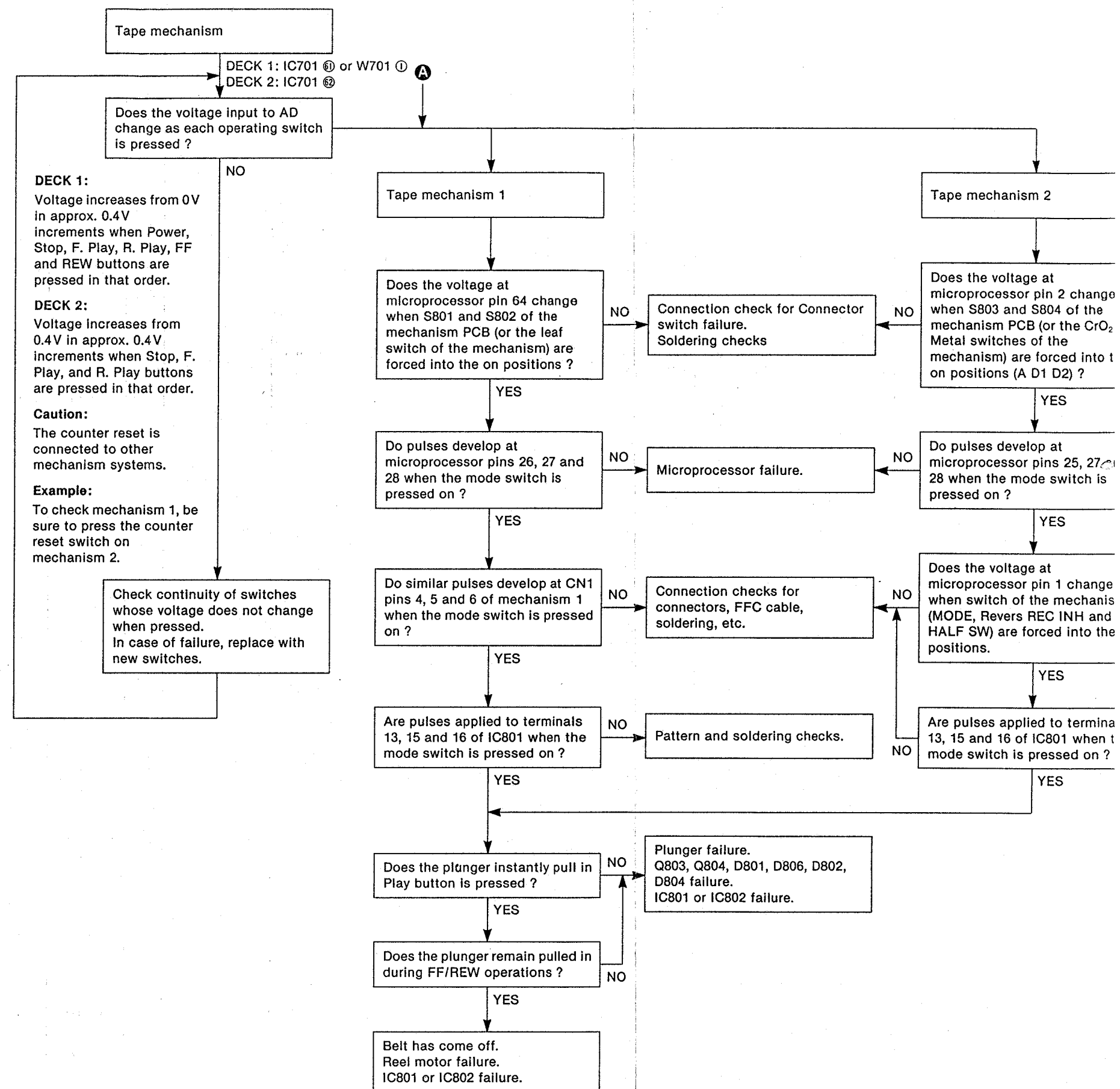
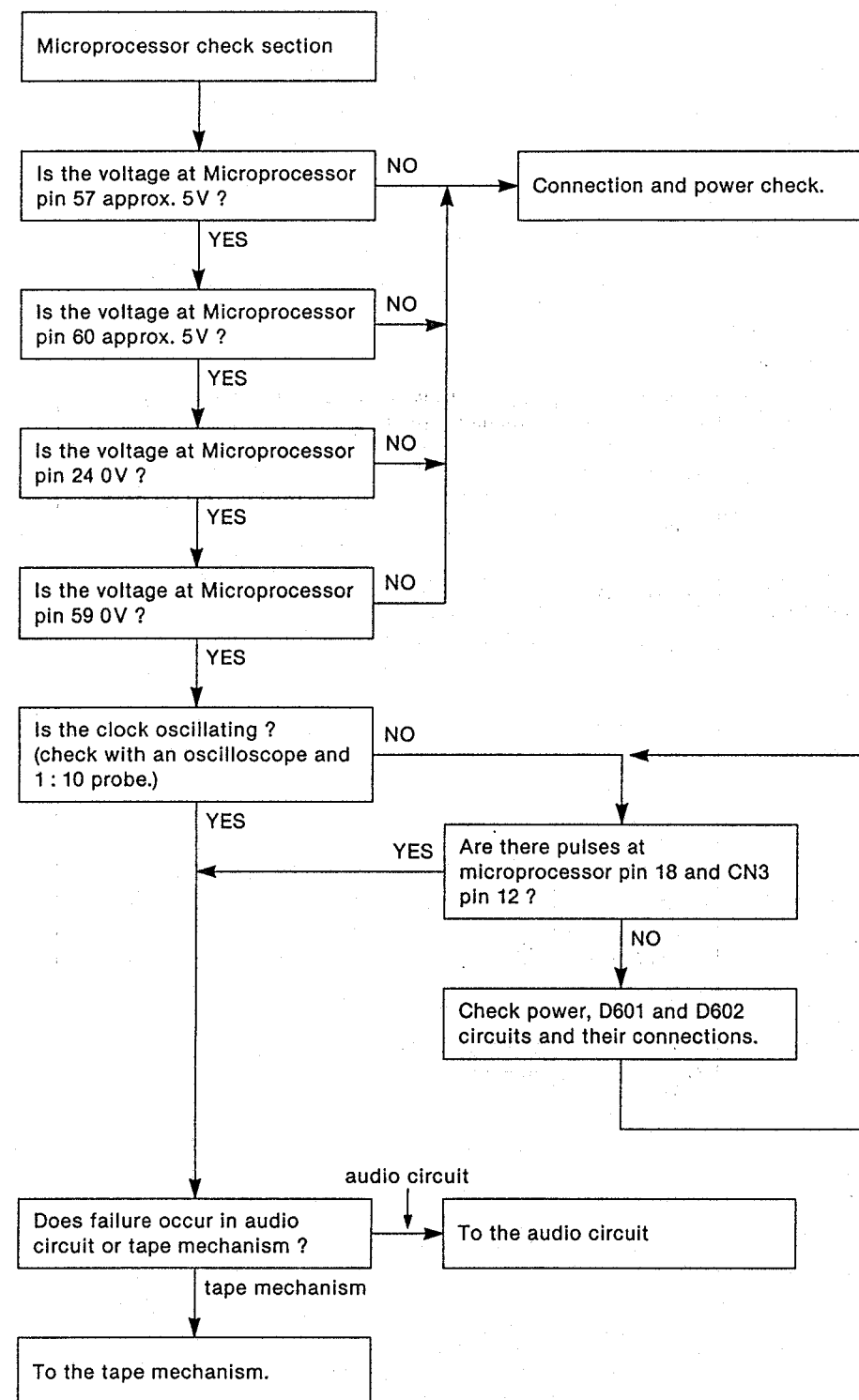


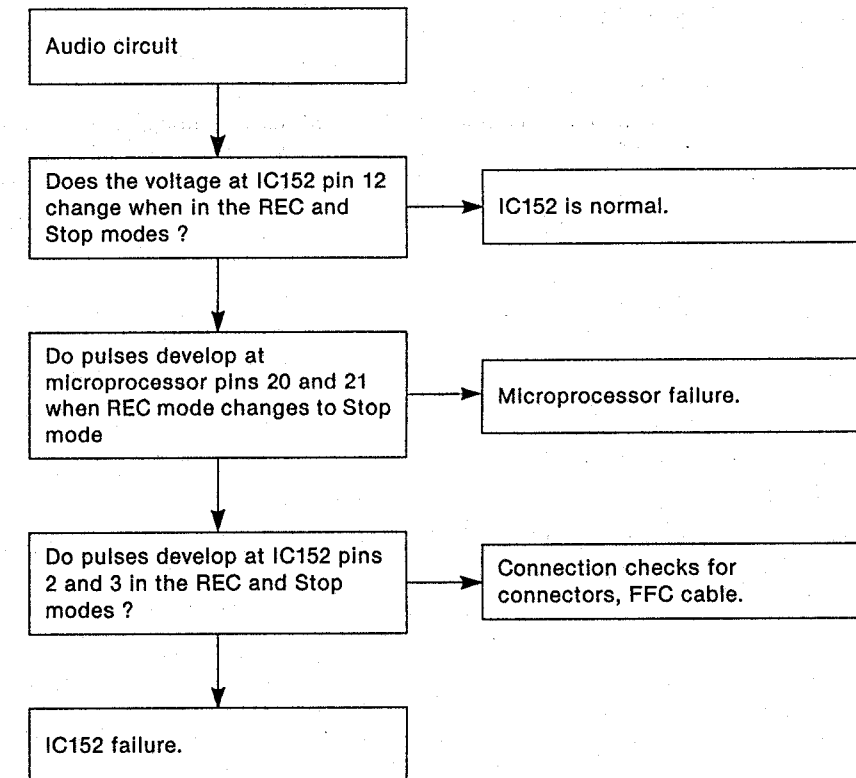
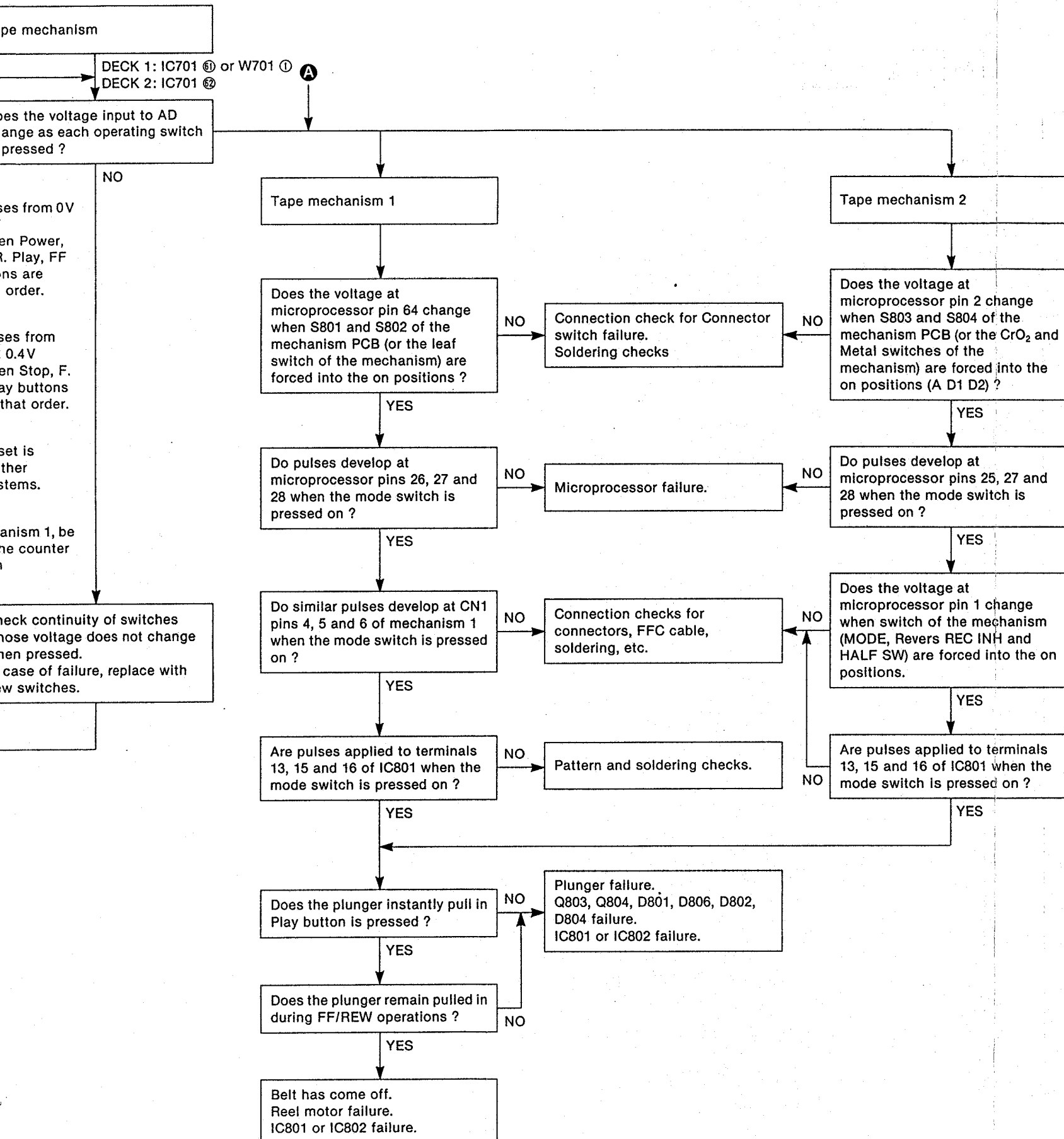
■ TROUBLESHOOTING GUIDE

*To perform troubleshooting, set the unit to the state described in the "Motor Control PCB Checking Method" on page 22.










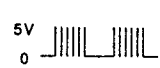

As shown above, check the voltage at each pin of IC152 for the following:


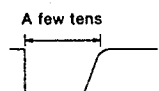

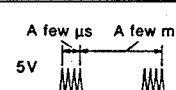


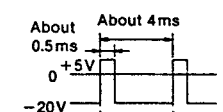
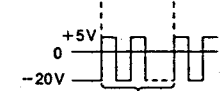
- ① Equalizer 120 μ s/70 μ s change.
- ② Dubbing seed does not change.
- ③ Erase current does not change between the CrO₂ and Normal/Metal tape.
(Erase current for CrO₂ and Normal tape is the same.)
- ④ Deck 1 and deck 2 produces no change.
- ⑤ Dolby off, B and C produces no change.
- ⑥ REC and Play produces no change.
- ⑦ Auto REC mute does not operate.

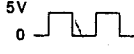



■ TERMINAL FUNCTION OF IC

• IC701 (M38123M4101F): MICROCOMPUTER

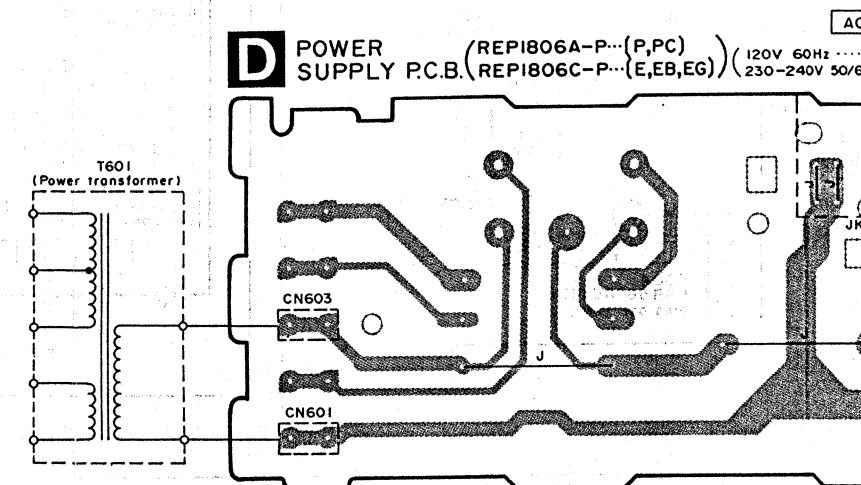
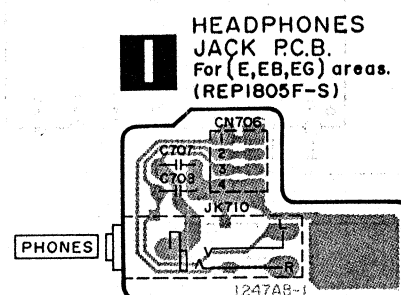
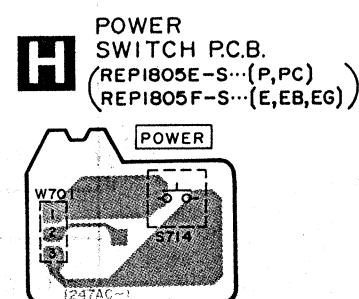
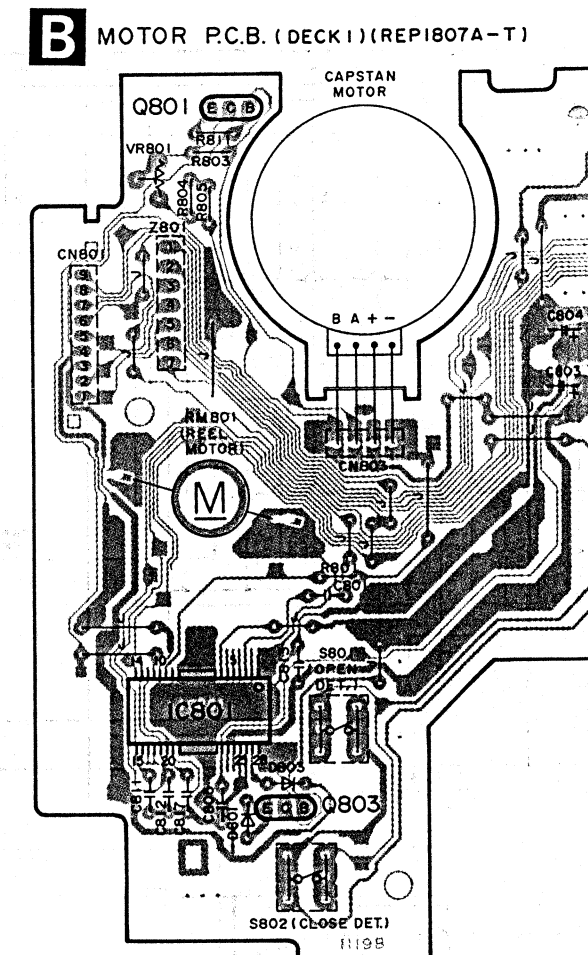
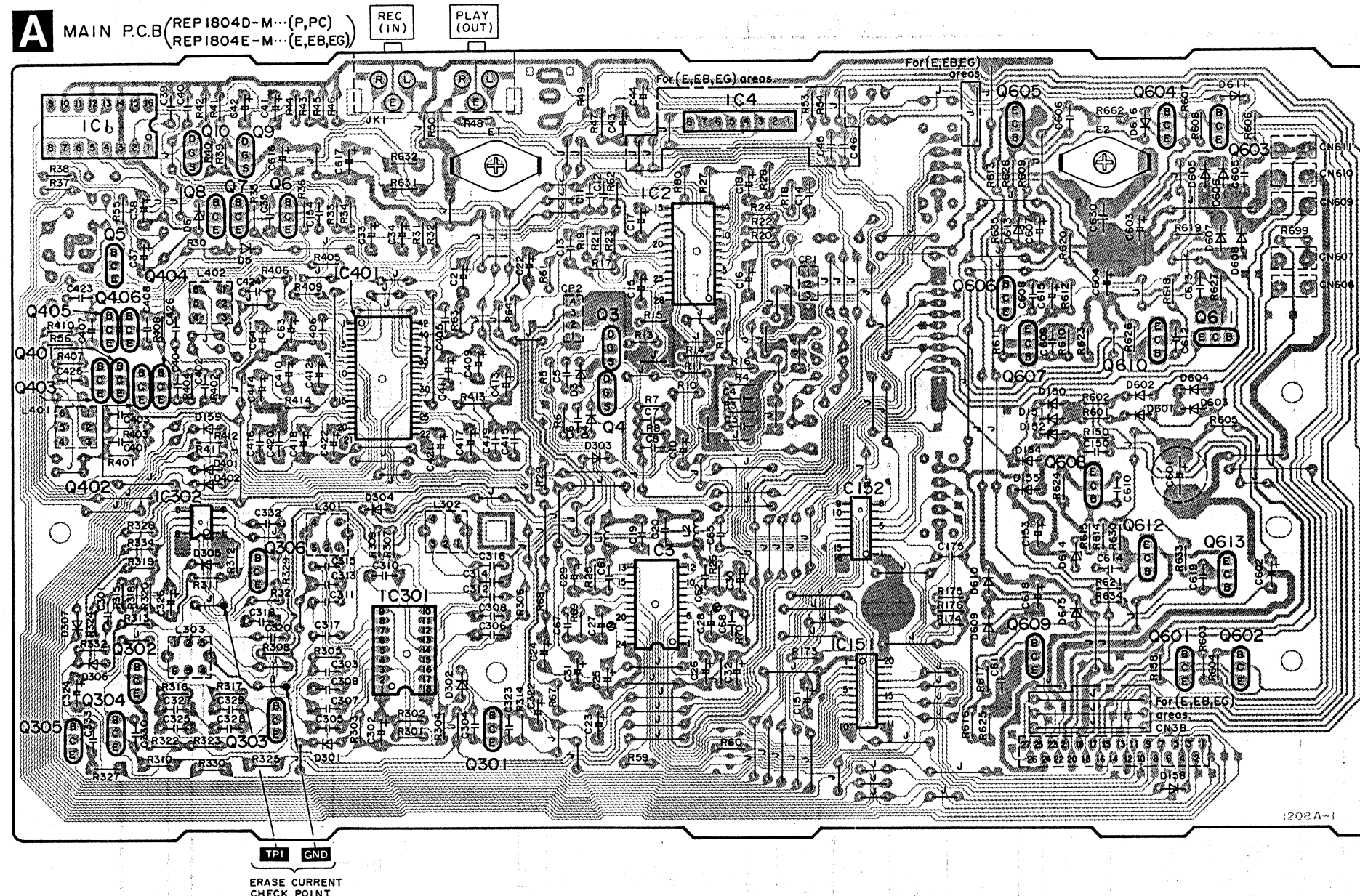
* To check the contents of the item "※" in the IC terminal table, set the unit to the state described in the "Motor Control PCB Checking Method" on page 22.

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
1	AD2D2	I	Deck 2 Mechanism switch (MODE, RINH, HALF) input	Connector CN2A ④ pin CN802 ⑤ pin	No tape load: Approx. 4.1V Normal tape with tab: Approx. 2.3V
2	AD1D2	I	Deck 2 Mechanism switch (FINH, CrO ₂ , Metal, OPEN/CLOSE) input	Connector CN2 ③ pin	No tape load: Approx. 4.1V Normal tape with tab: Approx. 0V Chrome tape with tab: Approx. 1.1V Metal tape with tab: Approx. 1.7V
3	METER-R	I	Rch indication level input	Connector CN3 ② pin	0V with no signal and 1V with 0VU (−20dB) input in the REC or PAUSE mode. The voltage varies from 0 to 5V for different input levels.
4	METER-L	I	Lch indication level input	Connector CN3 ① pin	
5	TEST		Test mode input	IC701 ⑤ pin	Normal: "H" (=4.8V) Test (Service) mode: "L" (=0V)
6	POWER	O	Power control output ON: "H", OFF: "L"	Connector CN3 ⑩ pin	Power ON: "H" (=5V) Power OFF: "L" (=0V)
7	MODEL	I	Model selector terminal	IC701 ⑦ pin	Normal: "L" (=0V) The deck malfunctions when set to "H".
8	MSP	I	TPS signal det. input ON: "L", OFF: "H"	Connector CN3B ⑧ pin	TPS mode No program: "H" (=5V) Programs: "L" (=0V)
9	—	—	Not used	—	—
10	DMT	O	Line out mute signal output ON: "L", OFF: "H"	Connector CN3 ⑪ pin	"L" (=0V) when sound is being produced in the play or REC mode and "H" (=2.5~5V) when no sound is produced in the stop of FF/REW mode.
11	ECS	O	E2PROM chip select signal ON: "H", OFF "L"	Connector CN704 ① pin CN704 ⑤ pin	 (ex...For ↑ REV PLAY mode is changed)
12	ECLK	O	E2PROM serial clock output ON: "L", OFF: "H"	Connector CN704 ② pin CN704 ④ pin	 Waveform appears in response to 11 above.
13	EDAT	I/O	E2PROM serial data input/output	Connector CN704 ③ pin	 (ex...For ↔ REV PLAY mode is changed) Waveform appears in response to 11 above.
14	PBADJ	O	Playback adj. output ON: "H", OFF: "L"	Connector CN3 ⑦ pin	Used for adjustment at factory but in the finished product. Remains at "L" (=0V).
15	OSC	O	Audio signal for adjustment output	Connector CN3 ⑥ pin	Generated signals at approx. 400Hz, 10kHz and 3kHz (square wave (H and L, 0 and 5V) in REC mode during adjustment of ATC).
16	STB	O	Strobe (load) output for the DA converter (IC151)	Connector CN3 ⑩ pin	Used to load output for the DA converter (IC151).
17	REMOTE	I	Remocon signal input ON: "H", OFF: "L"	Z701 ① pin	H and L pulse waveform appears on the input of a remote control signal.

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
18	POF	I	Power off det. input ON: "H", OFF: "L"	Connector CN3 ⑫ pin	 <p>Rectified waveform at both 50 and 60Hz (clamping at 5V)</p> <p>The microprocessor goes into standby mode when this signal is removed.</p>
19	RESET	I	Reset input ON: "L", OFF: "H"	IC701 ⑬ pin	 <p>Usually H (=5V) but L for a period of a few to a few tens of milliseconds is first plugged in when the player.</p>
20	SDAT	O	Serial data output for DA converter (IC151)/serial-parallel converter (IC152) ON: "H", OFF: "L"	Connector CN3 ⑩ pin	 <p>Data output in response to 21</p>
21	SCLK	O	Serial clock output for DA converter (IC151)/serial-parallel converter (IC152) ON: "H", OFF: "L"	Connector CN3 ⑨ pin	 <p>Pulse signal is emitted only when a mode change occurs.</p>
22	XIN	I	Microcomputer clock OSC terminal	Z702 ① pin terminal	 <p>Oscillator waveform at 6MHz</p>
23	XOUT	O	Microcomputer clock OSC terminal	Z702 ③ pin terminal	 <p>Oscillator waveform at 6MHz</p>
24	GND	—	Microcomputer GND	IC701 ⑭ pin	0V
25	MLAT2	O	Latch output (Deck 2) for mechanism control ON: "H", OFF: "L"	Connector CN2 ⑦ pin	Serial data is sent to: IC801, IC802, and the mechanism driver IC. Select the Deck 2 data from this serial data and load it into IC802.
26	MLAT1	O	Latch output (Deck 1) for mechanism control ON: "H", OFF: "L"	Connector CN1 ⑥ pin	Select the Deck 1 data from the serial data and load it into IC801.
27	MDAT	O	Serial data output for mechanism control ON: "H", OFF: "L"	Connector CN1 ⑤ pin CN2 ⑥ pin	Serial data used to control the mechanism driver via IC801 and IC802.
28	MCLK	O	Serial clock output for mechanism control ON: "H", OFF: "L"	Connector CN1 ④ pin CN2 ⑤ pin	Emitted only when mechanism mode changes.
29 } 45	P1 } P17	O	FL meter segment output ON: "H", OFF: "L"	FL701 ⑫~⑭ pin	
46 } 52	1G } 7G	O	FL meter glid output ON: "H", OFF: "L"	FL701 ⑤~⑪ pin	 <p>H for 0~8 pulses of duration approx. 0.5ms each.</p>

Pin No.	Mark	I/O Division	Function	Check point	※ Discription
53	RPT1	I	Deck 1 reel pulse det. input (take up side)	TRANSISTOR Q703 collector	 <p>Changes within the 0 ↔ 5V range each time the take up reel on deck 1 is through approximately 30 degrees.</p>
54	RPS1	I	Deck 1 reel pulse det. input (supply side)	TRANSISTOR Q704 collector	 <p>Supply reel on deck 1 Fast FF/REW mode is disabled unless both signals 53 and 54 are active.</p>
55	RPT2	I	Deck 2 reel pulse det. input (take up side)	TRANSISTOR Q705 collector	 <p>Take up reel on deck 2</p>
56	RPS2	I	Deck 2 reel pulse det. input (supply side)	TRANSISTOR Q706 collector	 <p>Supply reel on deck 2 Fast FF/REW mode is disabled unless both signals 55 and 56 are active.</p>
57	V _{DD}	—	Microcomputer terminal	Connector CN3 ⑩ pin	+5V, Backup
58	-VP	—	FL meter pull down voltage input terminal	Connector CN3 ⑪ pin	-20V
59	AV _{SS}	—	GND terminal (A/D)	Connector CN3 ⑫ pin	0V
60	V _{REF}	I	Reference power supply (+5V) (A/D)	Connector CN3 ⑬ pin CN1 ⑧ pin CN2 ⑨ pin	Can be checked at pin 7 of connector CN801 or at pin 9 of CN802.
61	KEY1	I	Key switch input	IC701 ⑭ pin	<p>DECK 1:</p> <p>When no key is pressed: 5V</p> <p>When Stop key is pressed: 0.4V</p> <p>When Power key is pressed: 0V</p> <p>When any other key is pressed: 0 to 5V</p>
62	KEY2	I	Key switch input	IC701 ⑮ pin	<p>DECK 2:</p> <p>When no key is pressed: 5V</p> <p>When Stop key is pressed: 0.4V</p> <p>When any other key is pressed: 0 to 5V</p>
63	MODEL2	I	Model selector terminal	IC701 ⑯ pin	<p>Change the voltage at this pin to match microprocessor operation to the individual model.</p> <p>TR474: Approx. 1.2V</p>
64	AD1D1	I	Deck 1 Mechanism switch (FINH, CrO ₂ , Metal, OPEN/CLOSE) input	Connector CN1 ⑰ pin	<p>No tape loaded: Approx. 4.1V</p> <p>Normal tape with tab: Approx. 2.3V</p> <p>Chrome tape with tab: Approx. 3.5V</p> <p>Metal tape with tab: Approx. 3.5V</p>

PRINTED CIRCUIT BOARDS



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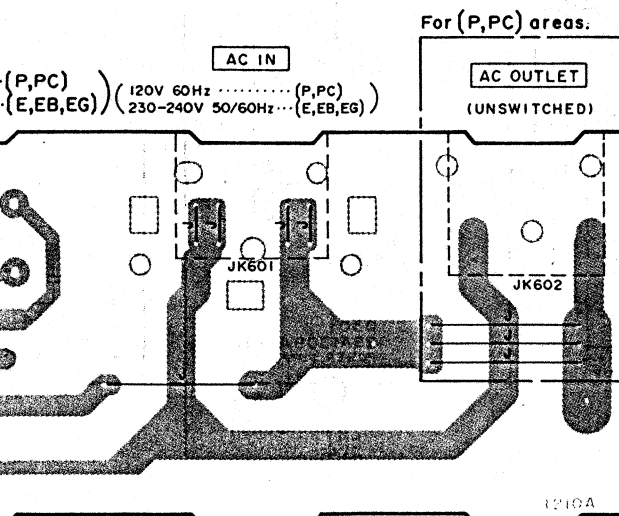
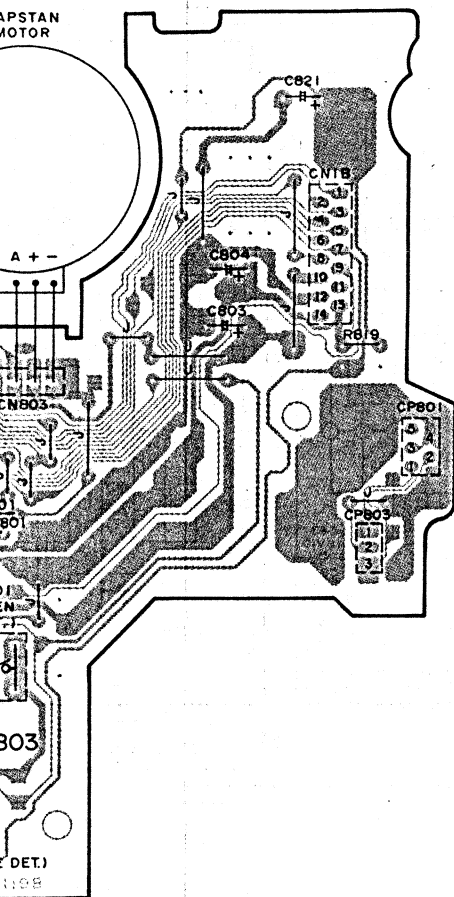
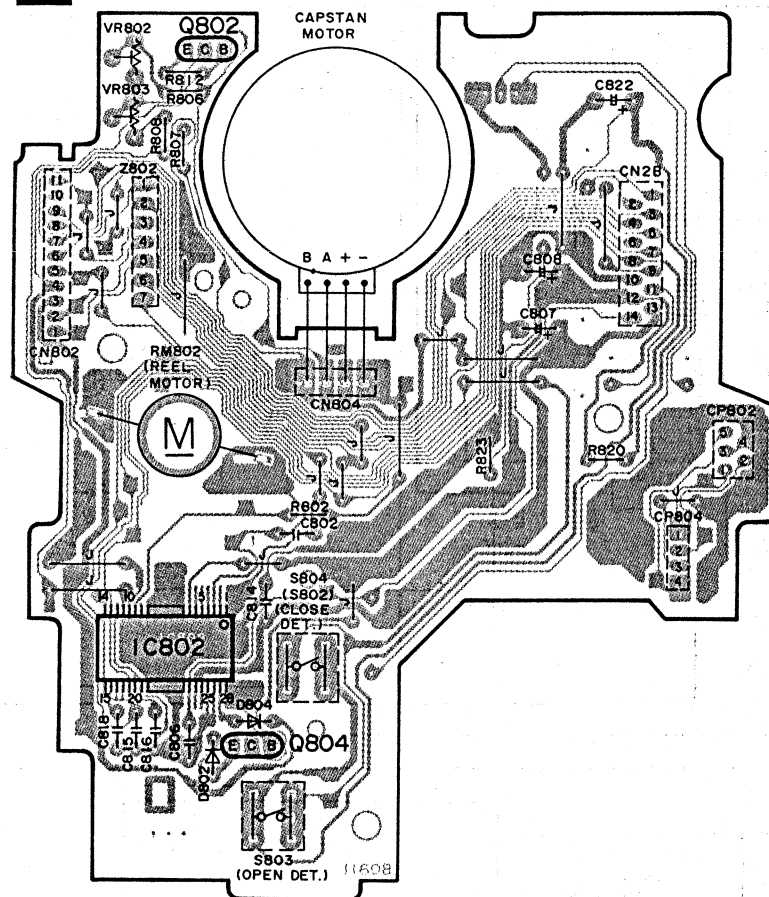
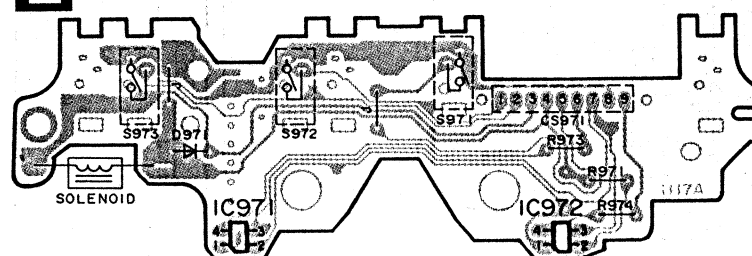
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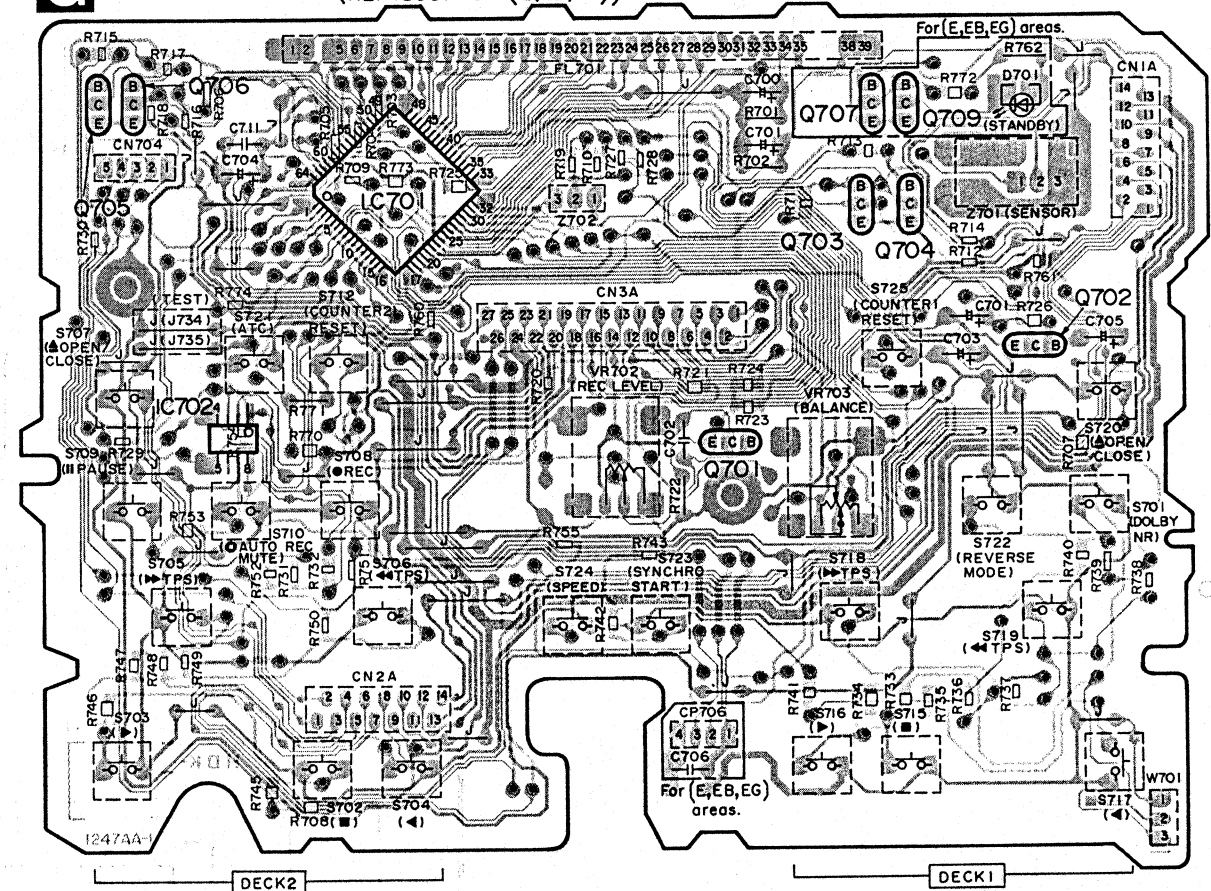
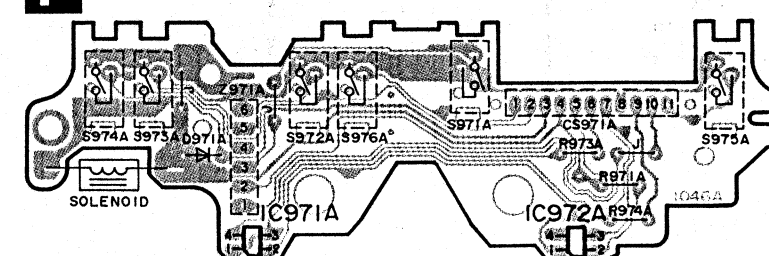
19

1)(REP1807A-T)

**C** MOTOR P.C.B.(DECK2)(REP1808A-T)**E** MECHANISM P.C.B.(DECK1)(REP1655A)**Notes:**

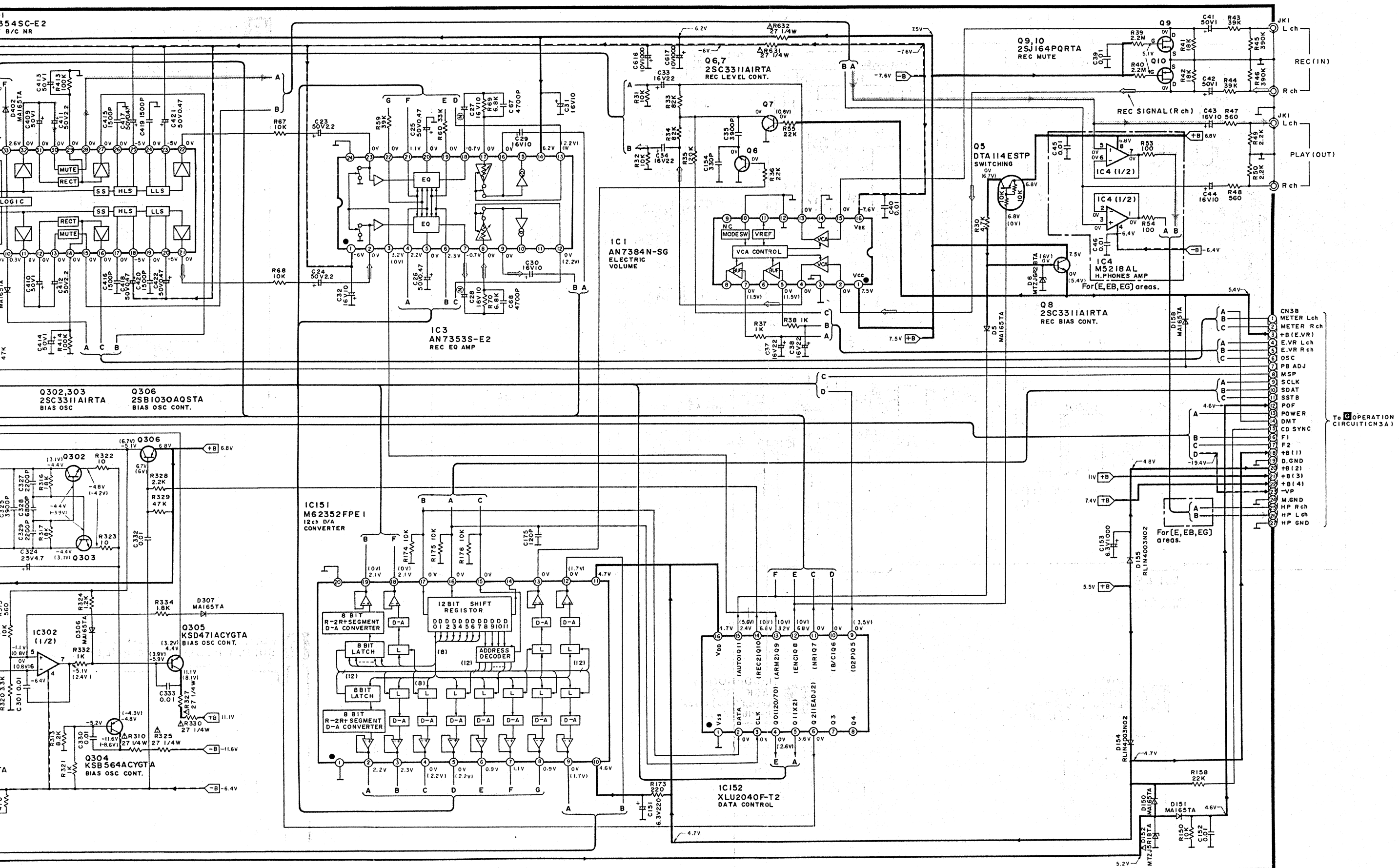
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in blue.
- The "●" mark denote the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- The resistors enclosed in red boxes in the PCB drawings are printed resistors.

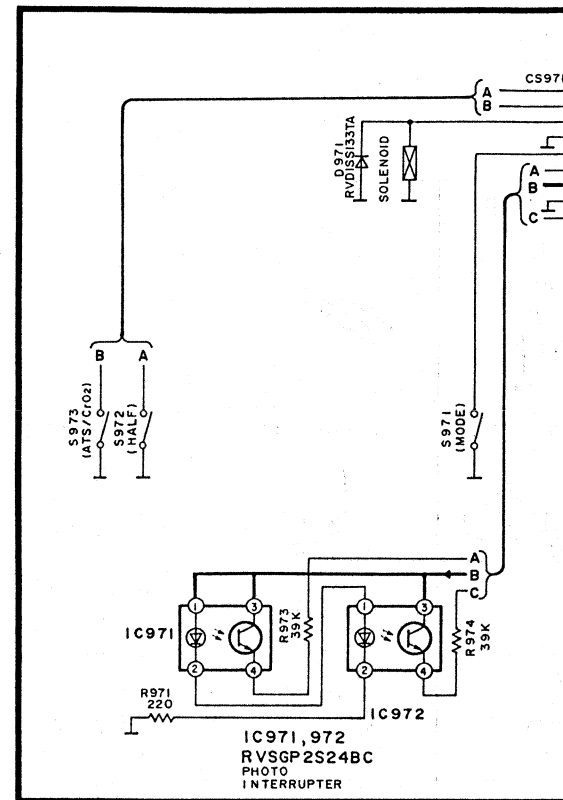
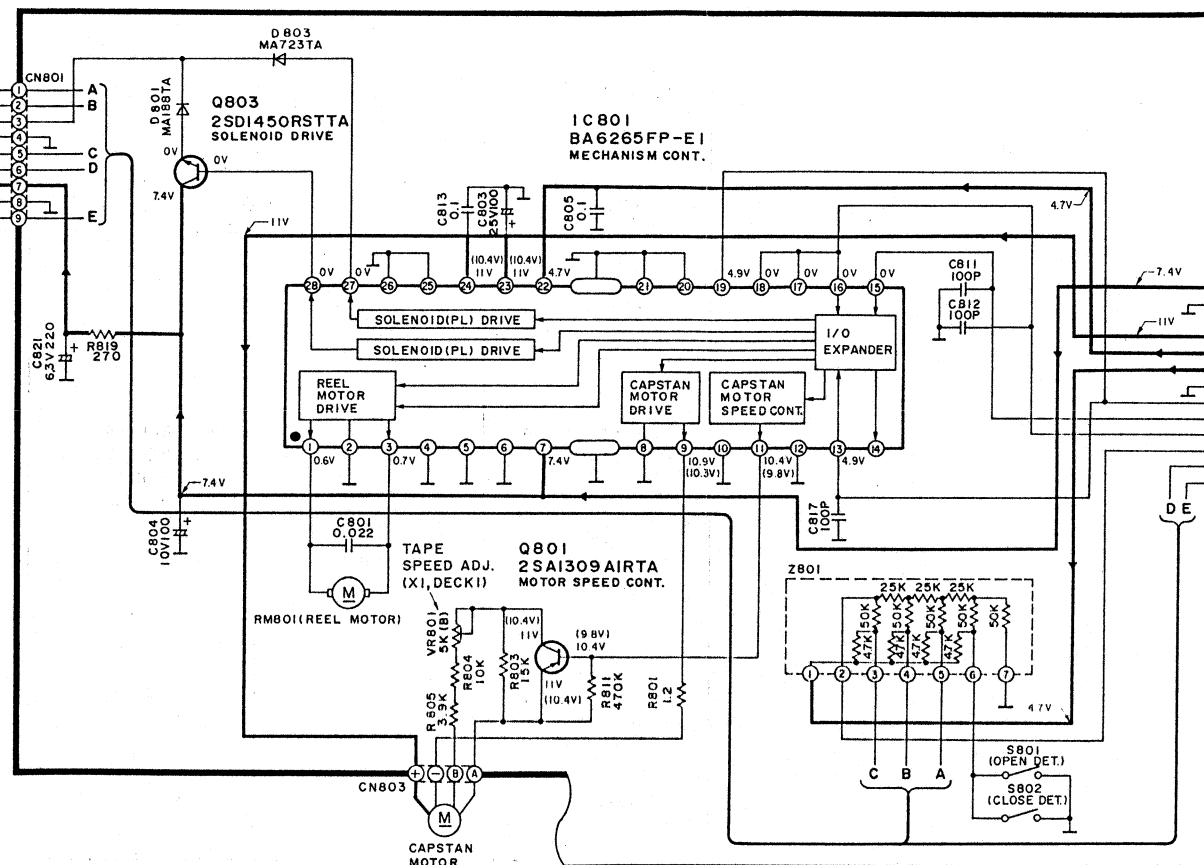
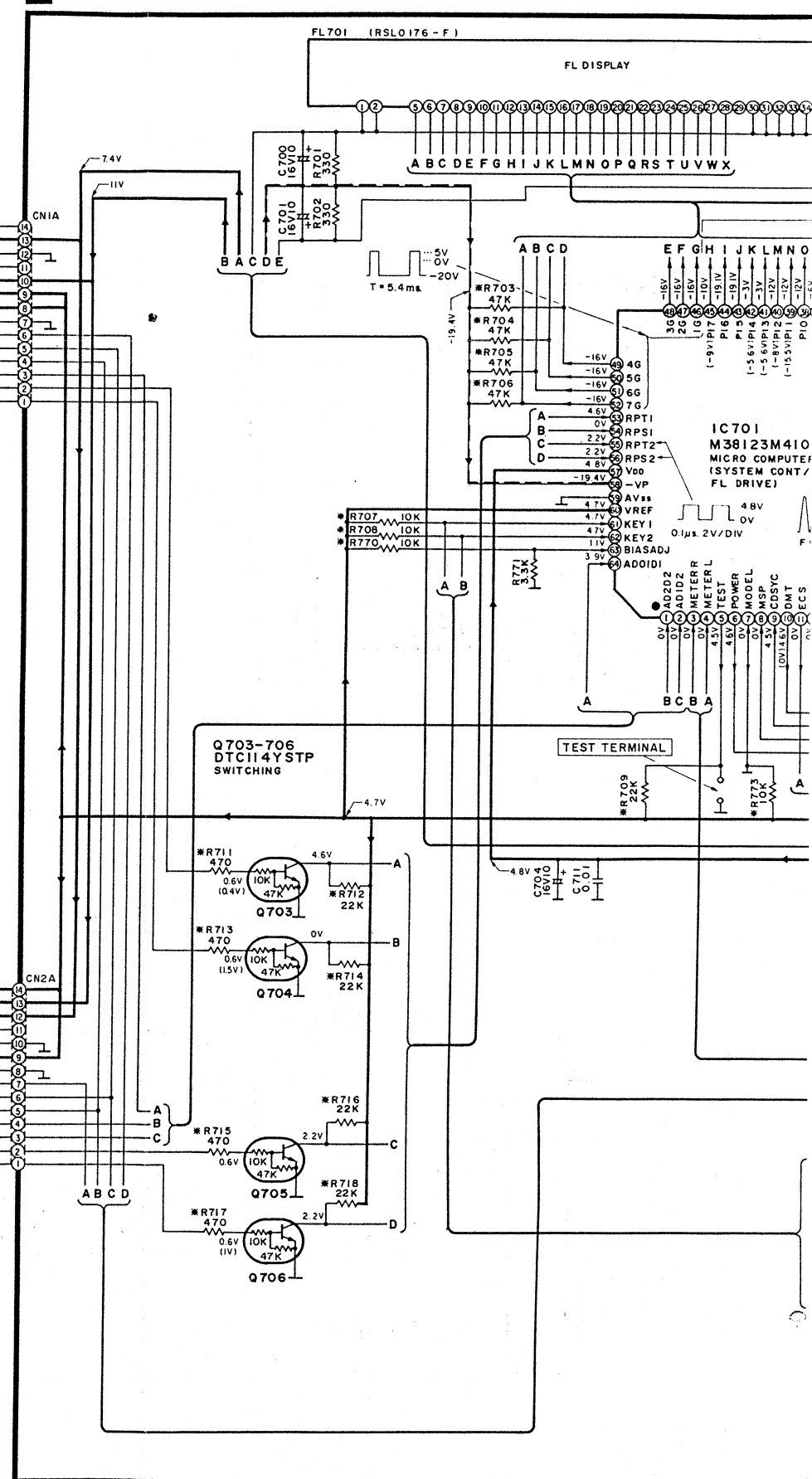
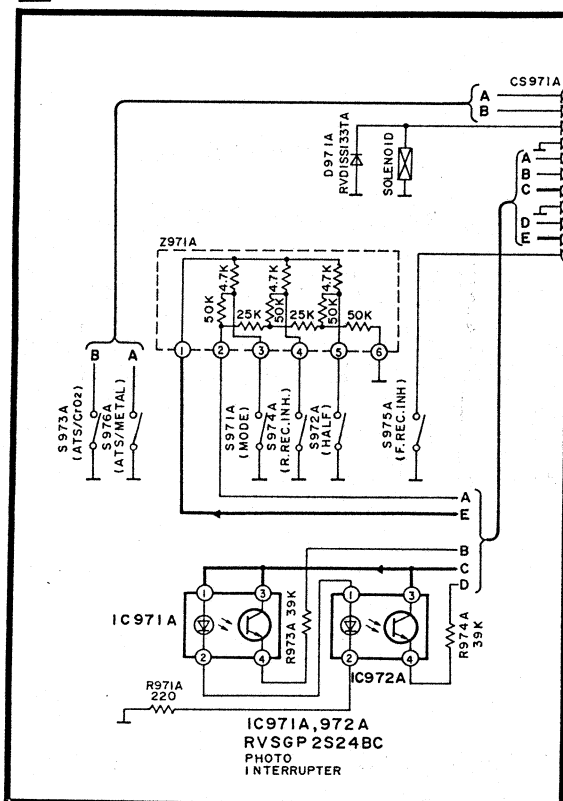
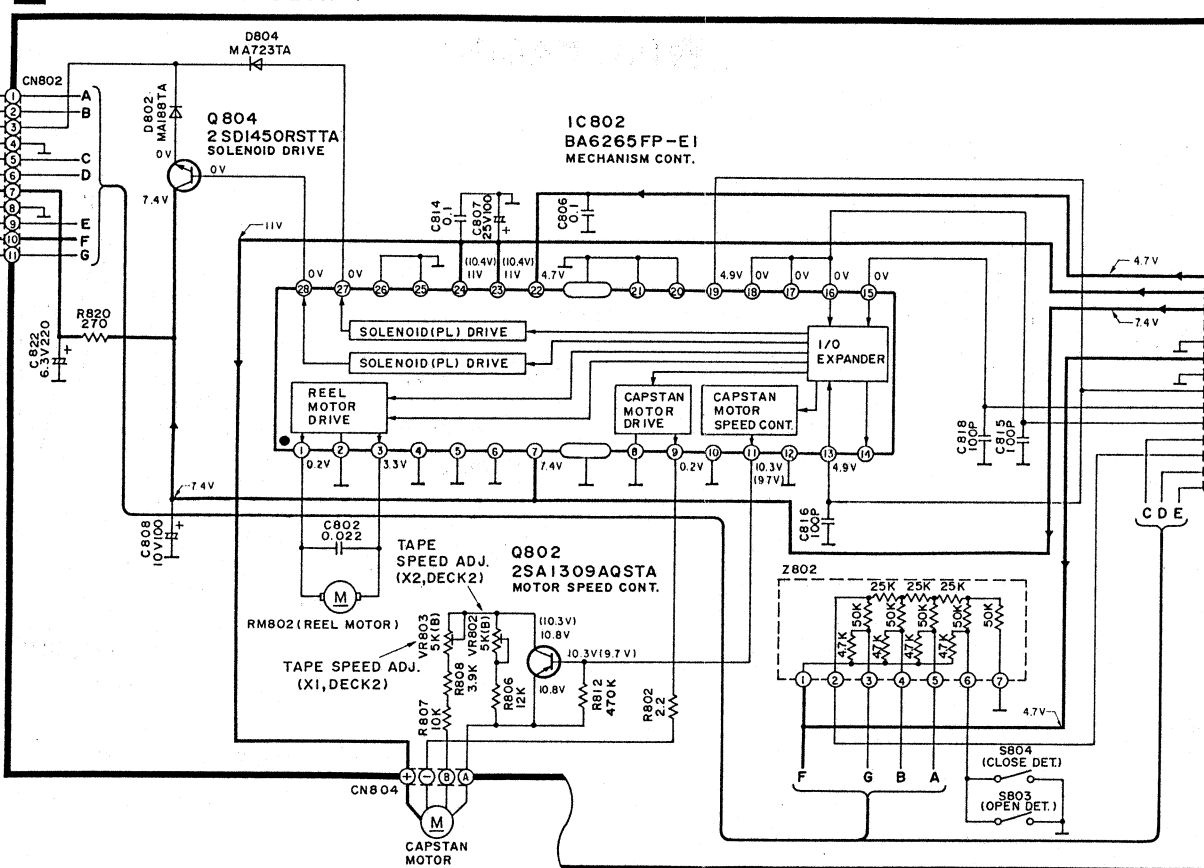
- This printed circuit board diagram may be modified at any time with the development of new technology.

G OPERATION P.C.B.(REP1805E-S... (P,PC)
REP1805F-S... (E,EB,EG))**F** MECHANISM P.C.B.(DECK2)(REP1656A)

A





E MECHANISM CIRCUIT (DECK1)**B** MOTOR CIRCUIT (DECK1)**G** OPERATION CIRCUIT**F** MECHANISM CIRCUIT (DECK2)**C** MOTOR CIRCUIT (DECK2)

SCHEMATIC DIAGRAM (Parts list on pages 57~60.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

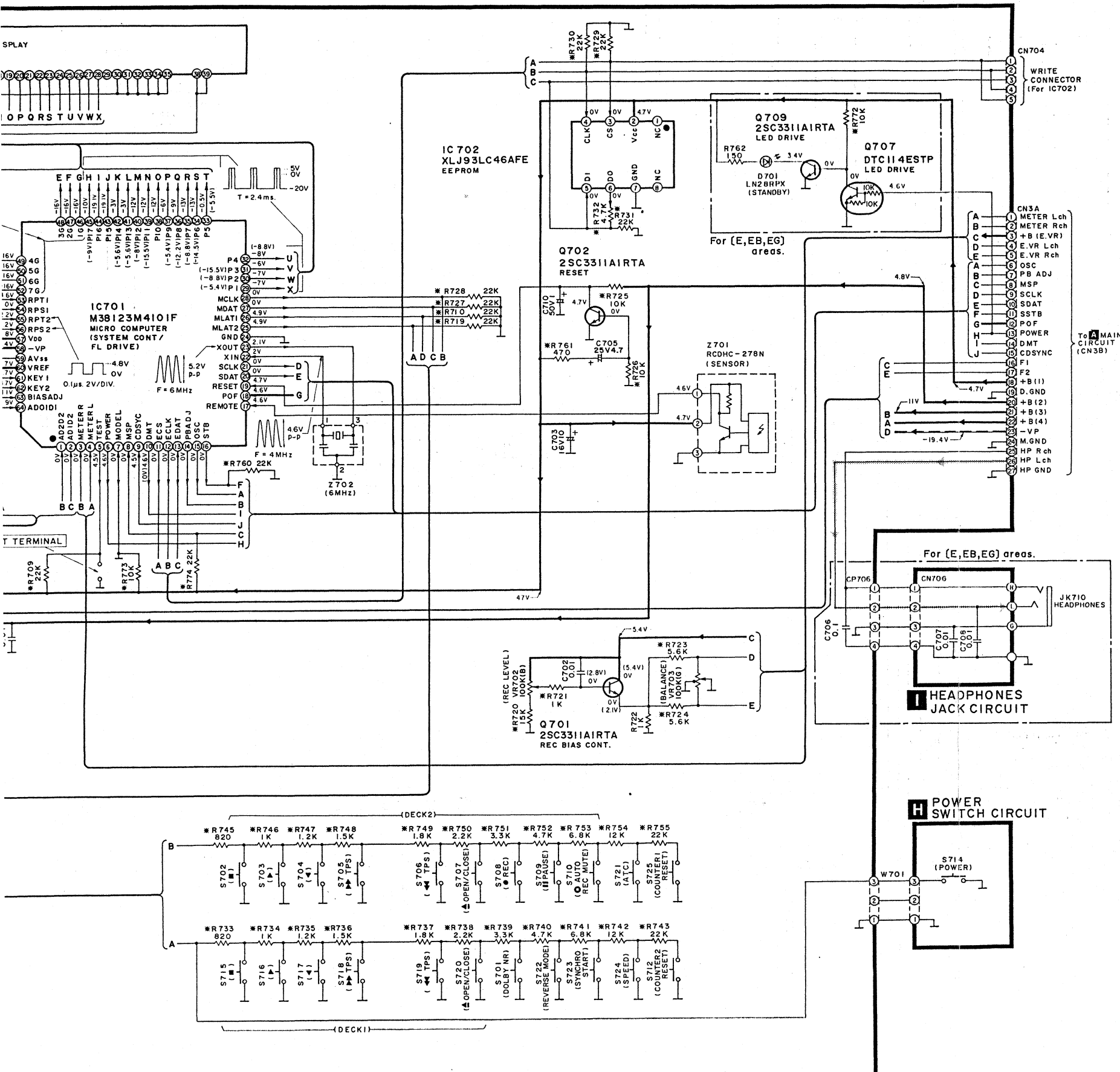
- S701 : Dolby noise-reduction switch (DOLBY NR; \square , \square).
- S702 : DECK 2 Stop switch (\blacksquare).
- S703 : DECK 2 Forward-side playback switch (\blacktriangleright).
- S704 : DECK 2 Reverse-side playback switch (\blacktriangleleft).
- S705 : DECK 2 Fast-forward search switch ($\blacktriangleright\blacktriangleright$ TPS).
- S706 : DECK 2 Rewind search switch ($\blacktriangleleft\blacktriangleleft$ TPS).
- S707 : DECK 2 Open/close switch (\blacktriangle OPEN/CLOSE).
- S708 : DECK 2 Record switch (\bullet REC).
- S709 : DECK 2 Pause switch (\blacksquare PAUSE).
- S710 : DECK 2 Automatic-record-muting switch (\bullet AUTO REC MUTE).
- S712 : DECK 2 Counter reset switch (COUNTER 2 RESET).
- S714 : Power "STANDBY ϕ /ON" switch (POWER, STANDBY ϕ /ON).
- S715 : DECK 1 Stop switch (\blacksquare).
- S716 : DECK 1 Forward-side playback switch (\blacktriangleright).
- S717 : DECK 1 Reverse-side playback switch (\blacktriangleleft).
- S718 : DECK 1 Fast-forward search switch ($\blacktriangleright\blacktriangleright$ TPS).
- S719 : DECK 1 Rewind search switch ($\blacktriangleleft\blacktriangleleft$ TPS).
- S720 : DECK 1 Open/close switch (\blacktriangle OPEN/CLOSE).
- S721 : Auto tape calibration switch (ATC).
- S722 : Reverse-mode select switch (REVERSE MODE).
- S723 : Synchro-start switch (SYNCHRO START).
- S724 : Tape-to-tape recording-speed switch (SPEED; X1, X2).
- S725 : DECK 1 Counter reset switch (COUNTER 1 RESET).
- S801 : DECK 1 Cassette holder open detection switch in "off" position.
- S802 : DECK 1 Cassette holder close detection switch in "off" position.
- S803 : DECK 2 Cassette holder open detection switch in "off" position.
- S804 : DECK 2 Cassette holder close detection switch in "off" position.
- S971 : DECK 1 Mode switch in "off" position.
- S971A : DECK 2 Mode switch in "off" position.
- S972 : DECK 1 Half switch in "off" position.
- S972A : DECK 2 Half switch in "off" position.
- S973 : DECK 1 ATS (CrO_2) switch in "off" position.
- S973A : DECK 2 ATS (CrO_2) switch in "off" position.
- S974A : DECK 2 Reverse rec. inhibit switch in "off" position.
- S975A : DECK 2 Forward rec. inhibit switch in "off" position.
- S976A : DECK 2 ATS (Metal) switch in "off" position.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
1K=1,000 (Ω), 1M=1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- () Voltage values at record mode.
- For measurement us EVM.
- Important safety notice
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
- ($\text{---} < +B > \text{---}$) Indicates +B (bias).
- ($\text{---} < -B > \text{---}$) indicates -B (bias).
- ($\text{---} < \text{PLAYBACK} > \text{---}$) indicates the flow of the playback signal.
- ($\text{---} < \text{RECORD} > \text{---}$) indicates the flow of the record signal.
- The supply part number is described alone in the replacement parts list,

Ref. No.	Production Part No.	Supply Part No.
IC4	M5218AL	M5218L
IC152	XLU2040F-T2	XLU2040F-T1
IC302	BA4560FT1	SVIBA4560FT1

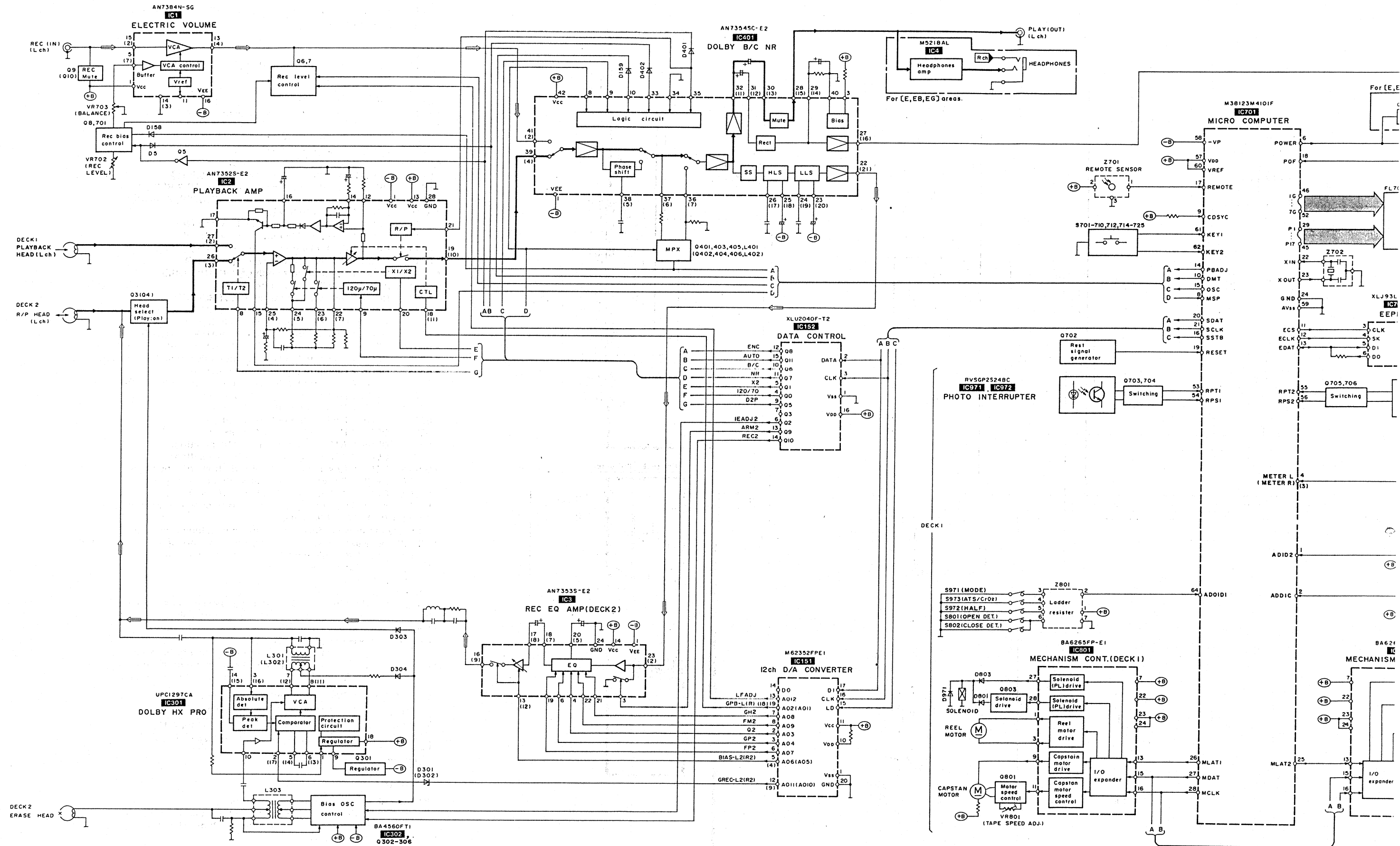
※ marks indicate printed resistor.

Caution!

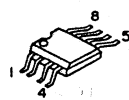
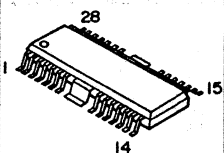
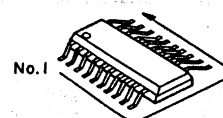
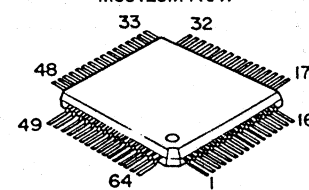
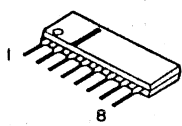
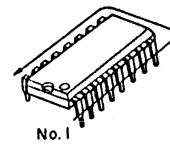
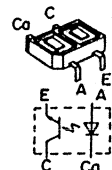
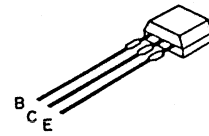
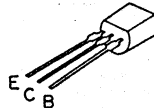

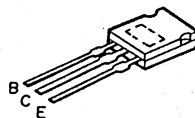

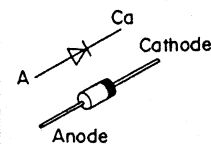
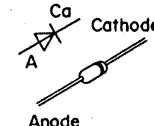
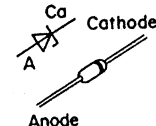
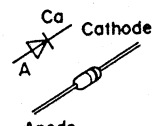
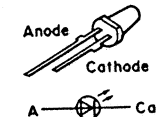
- IC and LSI are sensitive to static electricity.
- Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.



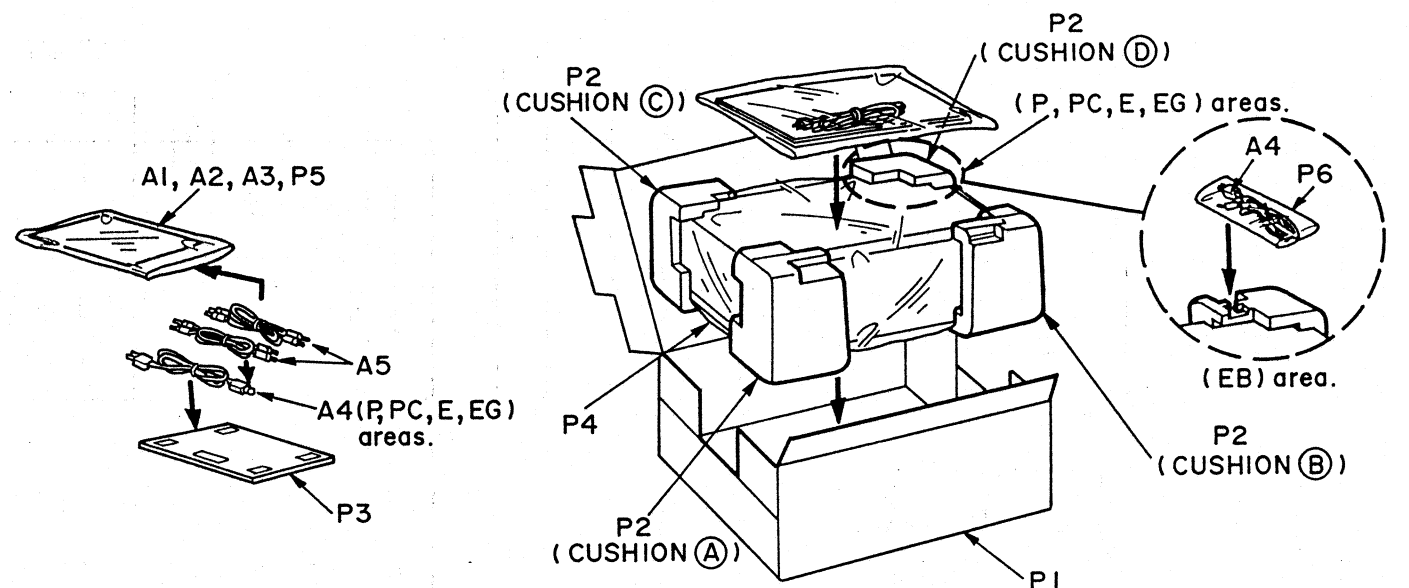
BLOCK DIAGRAM



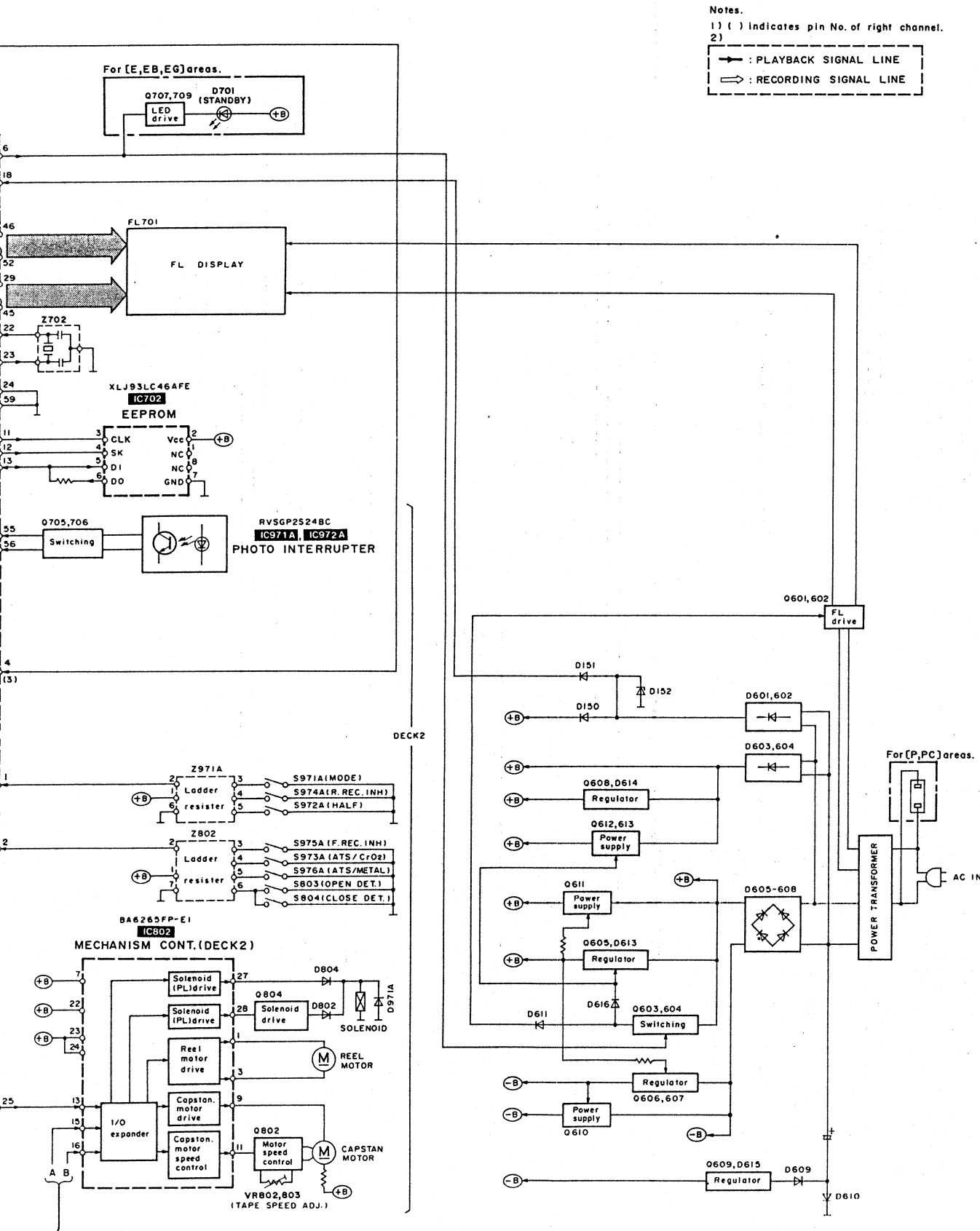
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

BA4560FT1 	BA6265FP-E1 	No. 1 	<table><tr><td>XLJ93LC46AFE</td><td>8 Pin</td></tr><tr><td>XLU2040F-T2</td><td>16 Pin</td></tr><tr><td>M62352FPE1</td><td>20 Pin</td></tr><tr><td>AN7353S-E2</td><td>24 Pin</td></tr><tr><td>AN7352S-E2</td><td>28 Pin</td></tr><tr><td>AN7354SC-E2</td><td>42 Pin</td></tr></table>	XLJ93LC46AFE	8 Pin	XLU2040F-T2	16 Pin	M62352FPE1	20 Pin	AN7353S-E2	24 Pin	AN7352S-E2	28 Pin	AN7354SC-E2	42 Pin	M38123M4101F 
XLJ93LC46AFE	8 Pin															
XLU2040F-T2	16 Pin															
M62352FPE1	20 Pin															
AN7353S-E2	24 Pin															
AN7352S-E2	28 Pin															
AN7354SC-E2	42 Pin															
M5218AL 	<table><tr><td>AN7384N-SG</td><td>16 Pin</td></tr><tr><td>UPC1297CA</td><td>18 Pin</td></tr></table> 	AN7384N-SG	16 Pin	UPC1297CA	18 Pin	RVSGP2S24BC 	DTA114ESTP DTC114ESTP DTC114YSTP 									
AN7384N-SG	16 Pin															
UPC1297CA	18 Pin															
KSB564ACYGTA KSD471ACYGTA 	2SA1309AIRTA 2SB1030AQSTA 2SC3311AIRTA 2SD1450RSTTA 	2SB1357EFTA 2SD2037EFTA 	2SJ164PQRTA 	RL1N4003N02 												
MA165TA MA167TA MA723TA RVD1SS133TA 	MTZJ5R1BTA MTZJ6R2BTA MTZJ6R8BTA MTZJ8R2CTA MTZJ20DTA 	MA188TA 	LN28RPX 													

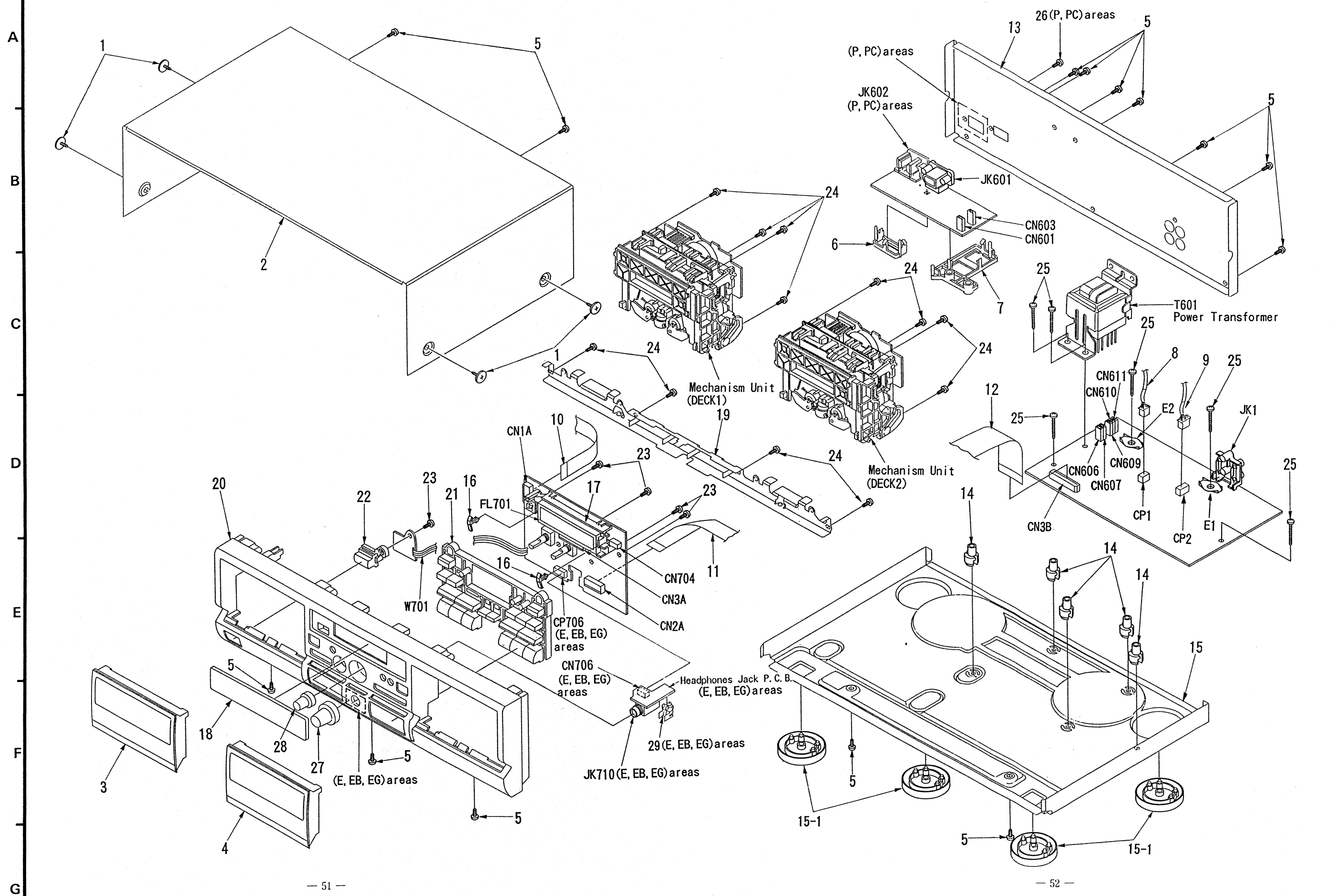
■ PACKAGING



<CUSHION A, B, C, D Part No.: RPN0664-1 (P, PC, E, EG), RPN0665 (EB)>



■ CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

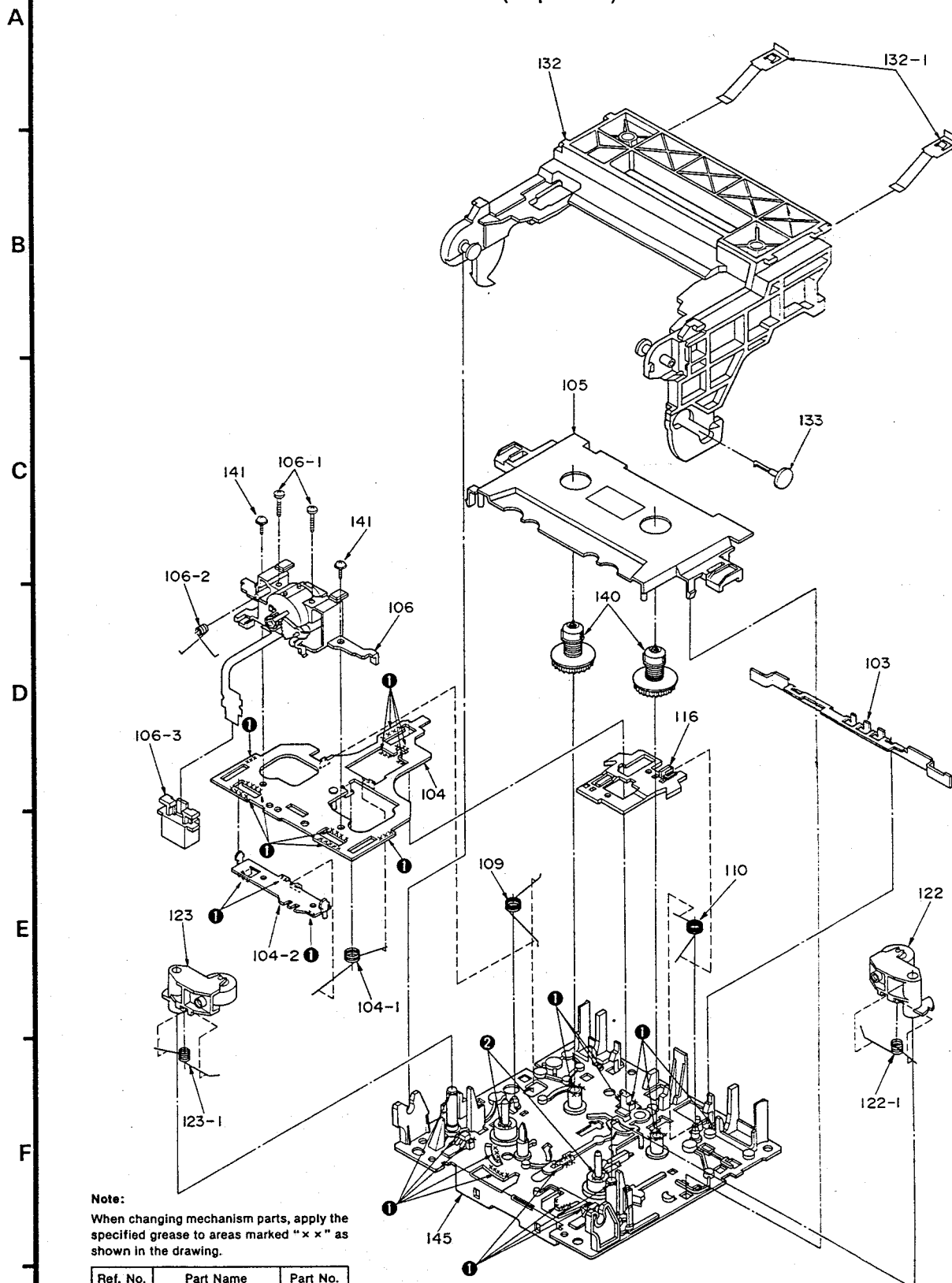
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		P5	XZB24X34C04	PROTECTION BAG (F. B., ACC.)	
				P6	RPHD032	MIRROR SHEET	(EB)
						ACCESSORIES	
1	RHD30035-K	SCREW		A1	RQT2233-P	INSTRUCTION MANUAL	(P)
2	RKM0260-K	CABINET		A1	RQT2237-B	INSTRUCTION MANUAL	(EB)
3	RYF0262A-K	CASSETTE LID (DECK1)		A1	RFKSSTR373E	INSTRUCTION MANUAL ASS'Y	(E)
4	RYF0262B-K	CASSETTE LID (DECK2)		A1	RFKSSTR373EG	INSTRUCTION MANUAL ASS'Y	(EG)
5	XTBS3+8JFZ1	SCREW		A1	RFKSSTR373PC	INSTRUCTION MANUAL ASS'Y	(PC)
6	RFKNSTR373AK	TRANSFORMER BASE 1 ASS'Y		A2	RQA0013	WARRANTY CARD	(E, EB, EG)
7	RFKNSTR373BK	TRANSFORMER BASE 2 ASS'Y		A2	RQA0085	WARRANTY CARD	(P)
8	REX0578	CONNECTOR ASS'Y (3P)		A2	SQX7183	WARRANTY CARD	(PC)
9	REX0579	CONNECTOR ASS'Y (4P)		A3	RQCB0169	SERVICENTER LIST	(E, EB, EG)
10	REZ0641	FLEXIBLE FLAT CABLE (14P)		A3	RQCB0391	SERVICENTER LIST	(P)
11	REZ0642	FLEXIBLE FLAT CABLE (14P)		A3	SQX9131	SERVICENTER LIST	(PC)
12	REZ0643	FLEXIBLE FLAT CABLE (27P)		A4	RJA0019-2K	AC POWER SUPPLY CORD	(E, EG) Δ (SF)
13	RGR0185A-B	REAR PANEL	(P, PC)	A4	SJA172	AC POWER SUPPLY CORD	(P, PC) Δ (SF)
13	RGR0185B-D1	REAR PANEL	(E, EG)	A4	VJA0733	AC POWER SUPPLY CORD	(EB) Δ (SF)
13	RGR0185B-F1	REAR PANEL	(EB)	A5	SJP2249-3	STEREO CONNECTION CABLE	
14	RKQ0089	P. C. B. HOLDER					
15	RFKJLPG460-K	BOTTOM CHASSIS ASS'Y					
15-1	RKA0053-A	FOOT					
16	RMN0195	FL HOLDER PIECE					
17	RMN0259	FL HOLDER					
18	RKW0326-R	TRANSPARENT PLATE	(P, PC)				
18	RKW0326B-R	TRANSPARENT PLATE	(E, EB, EG)				
19	RMA0766	MECHANISM ANGLE					
20	RFKGSTR474PK	FRONT PANEL ASS'Y	(P, PC)				
20	RFKGSTR474EK	FRONT PANEL ASS'Y	(E, EB, EG)				
21	RGU1023A-K	BUTTON, OPERATION					
22	RGU1026-K	BUTTON, POWER					
23	XTBS26+8J	SCREW					
24	XTB3+10JFZ	SCREW					
25	XTB3+20JFZ	SCREW					
26	XTBS3+8JFZ1	SCREW	(P, PC)				
27	RGW0197-K	KNOB, REC LEVEL					
28	RGW0198-K	KNOB, BALANCE					
29	RMC0234	GND PLATE, H. P. JACK	(E, EB, EG)				
		PACKING MATERIAL					
P1	RPG1913	PACKING CASE	(P, PC)				
P1	RPG1914	PACKING CASE	(E, EG)				
P1	RPG1915	PACKING CASE	(EB)				
P2	RPN0664-1	CUSHION	(P, PC, E, EG)				
P2	RPN0665	CUSHION	(EB)				
P3	RPQ0164	ACCESSORIES PAD					
P4	XZB50X65A02	PROTECTION COVER (THIS UNIT)					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		MECHANISM PARTS		135	RML0270A-1	DRIVE LEVER	
				136	RMQ0312A	DRIVE RACK	
				137	RMB0268	SPRING, HOLDER HOOK	
101	RXF0045	FLYWHEEL (F) ASS'Y (DECK1)		138	RML0271A	HOLDER HOOK	
101	RXF0045	FLYWHEEL (F) ASS'Y (DECK2)	(P, PC)	139	XTW2+6S	SCREW	
101	RXF0040	FLYWHEEL (F) ASS'Y (DECK2)	(E, EB, EG)	140	RXR0018	REEL TABLE	
102	RXF0046	FLYWHEEL (R) ASS'Y (DECK1)		141	XTW2+5L	SCREW	
102	RXF0046	FLYWHEEL (R) ASS'Y (DECK2)	(P, PC)	142	XTW26+12S	SCREW	
102	RXF0047	FLYWHEEL (R) ASS'Y (DECK2)	(E, EB, EG)	143	XTW26+6L	SCREW	
103	RML0272	SWITCH LEVER		144	RFKJSCH404AK	SUB CHASSIS ASS'Y	
104	RXQ0265	HEAD BASE ASS'Y		145	RFKJSCH404BK	CHASSIS ASS'Y	
104-1	RMB0266-1	SPRING, FOR /REV. SIDE ROD					
104-2	RXMD036	FOR /REV. SIDE ROD					
105	RGD0582-K	DRESSING PLATE					
106	RXQ0317	HEAD BLOCK (P. B.) (DECK1)					
106	RXQ0316	HEAD BLOCK (R/P) (DECK2)					
106-1	RHD17015	AZIMUTH ADJUSTMENT SCREW					
106-2	RMB0352	SPRING, HEAD HOLD					
106-3	RMQ0360A	CONNECTOR HOLDER					
107	RDV1082A	BELT (DECK1)					
107	RDV1082A	BELT (DECK2)	(P, PC)				
107	RDV0015	BELT (DECK2)	(E, EB, EG)				
108	RDK0019A	MAIN GEAR					
109	RMB0261	SPRING, HEAD BASE					
110	RMB0262	SPRING, BRAKE ROD					
111	RMB0263	SPRING (F)					
112	RMB0264	SPRING (R)					
113	RJW1472A	SPRING, TRIGGER LEVER					
114	RML0267A	TRIGGER LEVER					
115	RML0268A	FOR /REV. SIDE LEVER					
116	RMD0091A	BRAKE ROD					
117	RMS0398	MOVING IRON CORE					
118	RSJ0003	SOLENOID					
119	RUS6092C	SPRING, TAPE PRESSURE					
120	RXG0036	REEL GEAR					
121	RXL0106	IDLE GEAR					
122	RXP0052	PINCH ROLLER (F) ASS'Y					
122-1	RMB0259	SPRING, PINCH ROLLER (F)					
123	RXP0053	PINCH ROLLER (R) ASS'Y					
123-1	RMB0260	SPRING, PINCH ROLLER (R)					
124	RDG0206-1	LOADING GEAR					
125	RDG0209A	INTERMEDIATE GEAR					
126	REM0036-1	CAPSTAN MOTOR					
127	REM0043	REEL MOTOR					
128	RHD26013	SCREW					
129	RMC0169	SHIELD PLATE					
130	RMQ0314A	SURASITO SPACER					
131	RXG0037	FRICTION GEAR ASS'Y					
132	RYF0263-K	CASSETTE HOLDER ASS'Y					
132-1	RUS7572A	SPRING, TAPE PRESSURE					
133	RMQ0430	RIVET					
134	RMB0269	SPRING, DRIVE LEVER					

MECHANISM PARTS LOCATION

(Top view)



Note:

When changing mechanism parts, apply the specified grease to areas marked "x x" as shown in the drawing.

Ref. No.	Part Name	Part No.
①	FLOIL AK-152	SZZ0L18
②	SWAFLUID #56	RZZ0L02
③	MOLYCOAT EM-20L	RZZ0L05

REPLACEMENT PARTS LIST

Notes: *Important safety notice:

 Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Ref.No.	Part No.	Part Name & Description	Remarks	Ref.No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		Q707	DTC114ESTP	TRANSISTOR	(E, EB, EG)
				Q709	ZSC3311AIRTA	TRANSISTOR	(E, EB, EG)
IC1	AN7384N-SG	ELECTRIC VOLUME		Q801	2SA1309AIRTA	TRANSISTOR (DECK1)	
IC2	AN7352S-E2	PLAYBACK AMP		Q802	2SA1309A-R	TRANSISTOR (DECK2)	
IC3	AN7353S-E2	REQ EQ AMP (DECK2)		Q803	ZSD1450RTA	TRANSISTOR (DECK1)	
IC4	M5218L	HEADPHONES AMP	(E, EB, EG)	Q804	ZSD1450RTA	TRANSISTOR (DECK2)	
IC151	M62352FPE1	12ch D/A CONVERTER				DIODE (S)	
IC152	XLU2040F-T1	DATA CONTROL					
IC301	UPC1297CA	DOLBY HX PRO (DECK2)		D3, 4	MA167	DIODE	
IC302	SV1BA4560FT1	E. CURRENT ADJ. CONT. (DECK2)		D5	MA165	DIODE	
IC401	AN7354SC-E2	DOLBY B/C NR		D6	MTZJ6R2BTA	DIODE	
IC701	M38123M4101F	MICROCOMPUTER		D150, 151	MA165	DIODE	
IC702	XLJ93LC46AFE	EEPROM		D152	MTZJ5R1BTA	DIODE	Δ
IC801	BA6265FP-E1	MECHANISM CONTROL (DECK1)		D154, 155	RL1N4003N02	DIODE	
IC802	BA6265FP-E1	MECHANISM CONTROL (DECK2)		D158, 159	MA165	DIODE	
IC971	RVSGP2S24BC	PHOTO INTERRUPTER (DECK1)		D301, 302	MTZJ6R8BTA	DIODE	
IC971A	RVSGP2S24BC	PHOTO INTERRUPTER (DECK2)		D303-307	MA165	DIODE	
IC972	RVSGP2S24BC	PHOTO INTERRUPTER (DECK1)		D401, 402	MA165	DIODE	
IC972A	RVSGP2S24BC	PHOTO INTERRUPTER (DECK2)		D601, 602	MA165	DIODE	Δ
		TRANSISTOR(S)		D603-610	RL1N4003N02	DIODE	Δ
Q3, 4	2SJ164PQRTA	TRANSISTOR		D611	MA165	DIODE	
Q5	DTA114ESTP	TRANSISTOR		D613	MTZJ8R2CTA	DIODE	Δ
Q6-8	ZSC3311AIRTA	TRANSISTOR		D614	MTZJ6R2BTA	DIODE	Δ
Q9	2SJ164PQRTA	TRANSISTOR		D615	MTZJ200DTA	DIODE	Δ
Q10	2SJ164PQRTA	TRANSISTOR		D616	MA165	DIODE	
Q301	2SA1309AIRTA	TRANSISTOR		D701	LN28RPX	L. E. D.	(E, EB, EG)
Q302, 303	ZSC3311AIRTA	TRANSISTOR		D801	MA188TA	DIODE (DECK1)	
Q304	KSB564ACYGTA	TRANSISTOR		D802	MA188TA	DIODE (DECK2)	
Q305	KSD471ACYGTA	TRANSISTOR		D803	MA723TA	DIODE (DECK1)	
Q306	ZSB1030AQSTA	TRANSISTOR		D804	MA723TA	DIODE (DECK2)	
Q401-406	ZSC3311AIRTA	TRANSISTOR		D971	RVD1SS133TA	DIODE (DECK1)	
Q601, 602	ZSD1450RTA	TRANSISTOR		D971A	RVD1SS133TA	DIODE (DECK2)	
Q603	DTC114ESTP	TRANSISTOR				VARIABLE RESISTOR(S)	
Q604	2SA1309AIRTA	TRANSISTOR					
Q605	ZSD2037EFTA	TRANSISTOR	Δ	VR702	EVJ02FFA7B15	REC LEVEL CONTROL	
Q606	2SA1309AIRTA	TRANSISTOR		VR703	EVJ02SFA7G15	BALANCE CONTROL	
Q607	ZSB1357EFTA	TRANSISTOR	Δ	VR801	EVNDCAA03B53	TAPE SPEED ADJ. (DECK1:X1)	
Q608	ZSD2037EFTA	TRANSISTOR	Δ	VR802	EVNDCAA03B53	TAPE SPEED ADJ. (DECK2:X2)	
Q609	KSB564ACYGTA	TRANSISTOR	Δ	VR803	EVNDCAA03B53	TAPE SPEED ADJ. (DECK2:X1)	
Q610	ZSB1357EFTA	TRANSISTOR				COIL(S)	
Q611	ZSD2037EFTA	TRANSISTOR					
Q612, 613	ZSD2037EFTA	TRANSISTOR	Δ	L1, 2	SLQX303-1KT	COIL	
Q701, 702	ZSC3311AIRTA	TRANSISTOR		L301, 302	SL09B1-Z	COIL	
Q703-706	DTC114YSTP	TRANSISTOR		L303	SL09B4-K	COIL (HX PRO ADJ.)	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
L401, 402	RLM2B006T-K	COIL		S973	RSH1A019-U	ATS (DECK1)	
		TRANSFORMER (S)		S973A	RSH1A019-U	ATS (DECK2)	
				S974A	RSH1A019-U	R. REC. INH. (DECK2)	
				S975A	RSH1A019-U	F. REC. INH. (DECK2)	
T601	RTP1K4B018-V	POWER TRANSFORMER	(E, EB, EG) △	S976A	RSH1A019-U	ATS (DECK2)	
T601	RTP1K4C015-V	POWER TRANSFORMER	(P, PC) △			CONNECTOR(S) AND SOCKET(S)	
		OSC. (S) AND COMBINATION(S)					
				CN1A	RJS1A6214-1	CONNECTOR(14P)	
Z701	RCDHC-278N	REMOTE SENSOR		CN1B	RJS1A6714	CONNECTOR(14P) (DECK1)	
Z702	EF0EC6004T4	CERAMIC OSCILLATOR(6MHz)		CN2A	RJS1A6214-1	CONNECTOR(14P)	
Z801	EXBF7L355SYV	COMBINATION PART (DECK1)		CN2B	RJS1A6714	CONNECTOR(14P) (DECK2)	
Z802	EXBF7L355SYV	COMBINATION PART (DECK2)		CN3A	RJS1A6227-1	CONNECTOR(27P)	
Z971A	EXBF6L306SVV	COMBINATION PART (DECK2)		CN3B	RJS1A6827	CONNECTOR(27P)	
		DISPLAY TUBE(S)		CN601	RJS1A1101T1	CONNECTOR(1P)	
				CN603	RJS1A1101T1	CONNECTOR(1P)	
FL701	RSL0176-F	DISPLAY TUBE		CN606, 607	RJS1A1101T1	CONNECTOR(1P)	
		SWITCH(ES)		CN609-611	RJS1A1101T1	CONNECTOR(1P)	
				CN704	SJS50581BB	SOCKET(5P)	
S701	EVQ21405R	DOLBY NR(B, C)		CN706	RJU057W004	SOCKET(4P)	(E, EB, EG)
S702	EVQ21405R	STOP (DECK2)		CN801	RJT071H09A	CONNECTOR(9P) (DECK1)	
S703	EVQ21405R	F. -SIDE PLAYBACK (DECK2)		CN802	RJT071H11A	CONNECTOR(11P) (DECK2)	
S704	EVQ21405R	R. -SIDE PLAYBACK (DECK2)		CN803	RJR0113	MOTOR CONNECTOR(4P) (DECK1)	
S705	EVQ21405R	F. F. SEARCH<TPS> (DECK2)		CN804	RJR0113	MOTOR CONNECTOR(4P) (DECK2)	
S706	EVQ21405R	REW. SEARCH<TPS> (DECK2)		CP1	SJTD313	CONNECTOR(3P)	
S707	EVQ21405R	OPEN/CLOSE (DECK2)		CP2	SJTD413	CONNECTOR(4P)	
S708	EVQ21405R	REC (DECK2)		CP706	RJT057W004-1	CONNECTOR(4P)	(E, EB, EG)
S709	EVQ21405R	PAUSE (DECK2)		CP801	RJS2A0205-2S	CONNECTOR(5P) (DECK1)	
S710	EVQ21405R	AUTO REC MUTE (DECK2)		CP802	RJS2A0205-2S	CONNECTOR(5P) (DECK2)	
S712	EVQ21405R	COUNTER2 RESET (DECK2)		CP803	RJP3G172A	CONNECTOR(3P) (DECK1)	
S714	EVQ21405R	POWER		CP804	RJP4G172A	CONNECTOR(4P) (DECK2)	
S715	EVQ21405R	STOP (DECK1)		CS971	RJU071H09M	SOCKET(9P) (DECK1)	
S716	EVQ21405R	F. -SIDE PLAYBACK (DECK1)		CS971A	RJU071H11M	SOCKET(11P) (DECK2)	
S717	EVQ21405R	R. -SIDE PLAYBACK (DECK1)				JACK(S)	
S718	EVQ21405R	F. F. SEARCH<TPS> (DECK1)					
S719	EVQ21405R	REW. SEARCH<TPS> (DECK1)		JK1	SJF3069N	TERMINAL BOARD: REC/PLAY	
S720	EVQ21405R	OPEN/CLOSE (DECK1)		JK601	SJSD16	AC INLET	(P, PC) △
S721	EVQ21405R	ATC (DECK2)		JK601	SJS9236	AC INLET	(E, EB, EG) △
S722	EVQ21405R	REVERSE MODE		JK602	RJS1A1602-1S	AC OUTLET	(P, PC) △
S723	EVQ21405R	SYNCHRO START		JK710	SJJ146B	HEADPHONES JACK	(E, EB, EG)
S724	EVQ21405R	SPEED(X1, X2)				GND PART(S)	
S725	EVQ21405R	COUNTER1 RESET (DECK1)					
S801	RSH1A024-U	OPEN DETECTION (DECK1)		E1, 2	SNE1004-1	GND PLATE	
S802	RSH1A024-U	CLOSE DETECTION (DECK1)				FLAT CABLE(S)	
S803	RSH1A024-U	OPEN DETECTION (DECK2)					
S804	RSH1A024-U	CLOSE DETECTION (DECK2)					
S971	RSH1A018-U	MODE (DECK1)		W701	REZ0640	FLAT CABLE(3P)	
S971A	RSH1A018-U	MODE (DECK2)					
S972	RSH1A019-U	HALF (DECK1)					
S972A	RSH1A019-U	HALF (DECK2)					

RESISTORS AND CAPACITORS

Notes : • Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
• Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS						
R3, 4	ERDS2TJ224T	1/4W 220K	R311	ERDS2TJ102	1/4W 1K	R699	ERDS2TJ2R7T	1/4W 2.7
R5, 6	ERDS2TJ225	1/4W 2.2M	R312	ERDS2TJ682T	1/4W 6.8K	R701, 702	ERDS2TJ331	1/4W 330
R7, 8	ERDS2TJ224T	1/4W 220K	R313	ERDS2TJ822	1/4W 8.2K	R722	ERDS2TJ102	1/4W 1K
R10	ERDS2TJ225	1/4W 2.2M	R314	ERDS2TJ471	1/4W 470	R762	ERDS2TJ151	1/4W 150 (E, EB, EG)
R11-14	ERDS2TJ101	1/4W 100	R315	ERDS2TJ561	1/4W 560	R771	ERDS2TJ102	1/4W 3.3K
R15, 16	ERDS2EJ121	1/4W 120	R316, 317	ERDS2TJ183T	1/4W 18K	R801	ERDS2TJ1R2	1/4W 1.2 (DECK1)
R17, 18	ERDS2TJ474	1/4W 470K	R318	ERDS2TJ393	1/4W 39K	R802	ERDS2TJ2R2T	1/4W 2.2 (DECK2)
R19, 20	ERDS2TJ103	1/4W 10K	R319	ERDS2TJ103	1/4W 10K	R803	ERDS2TJ153	1/4W 15K (DECK1)
R21, 22	ERDS2TJ273	1/4W 27K	R320	ERDS2TJ332	1/4W 3.3K	R804	ERDS2TJ103	1/4W 10K (DECK1)
R23, 24	ERDS2TJ183T	1/4W 18K	R321	ERDS2TJ102	1/4W 1K	R805	ERDS2TJ392T	1/4W 3.9K (DECK1)
R25, 26	ERDS2TJ103	1/4W 10K	R322, 323	ERDS2TJ100	1/4W 10	R806	ERDS2TJ123	1/4W 12K (DECK2)
R27, 28	ERDS2TJ101	1/4W 100	R324	ERDS2TJ122	1/4W 1.2K	R807	ERDS2TJ103	1/4W 10K (DECK2)
R29	ERDS2TJ332	1/4W 3.3K	R325	ERD2FCVG270T	1/4W 27 Δ	R808	ERDS2TJ392T	1/4W 3.9K (DECK2)
R30	ERDS2TJ472	1/4W 4.7K	R327	ERD2FCVG270T	1/4W 27 Δ	R811	ERDS2TJ474	1/4W 470K (DECK1)
R31, 32	ERDS2TJ103	1/4W 10K	R328	ERDS2TJ222	1/4W 2.2K	R812	ERDS2TJ474	1/4W 470K (DECK2)
R33, 34	ERDS2TJ823T	1/4W 82K	R329	ERDS2TJ473	1/4W 47K	R819	ERDS2TJ271	1/4W 270 (DECK1)
R35	ERDS2TJ124T	1/4W 120K	R330	ERD2FCVG270T	1/4W 27 Δ	R820	ERDS2TJ271	1/4W 270 (DECK2)
R36	ERDS2TJ223	1/4W 22K	R332	ERDS2TJ102	1/4W 1K	R971	ERDS2TJ221	1/4W 220 (DECK1)
R37, 38	ERDS2TJ102	1/4W 1K	R334	ERDS2TJ182	1/4W 1.8K	R971A	ERDS2TJ221	1/4W 220 (DECK2)
R39, 40	ERDS2TJ225	1/4W 2.2M	R401-404	ERDS2TJ684	1/4W 680K	R973	ERDS2TJ393	1/4W 39K (DECK1)
R41, 42	ERDS2TJ183T	1/4W 18K	R405, 406	ERDS2TJ152	1/4W 1.5K	R973A	ERDS2TJ393	1/4W 39K (DECK2)
R43, 44	ERDS2TJ393	1/4W 39K	R407, 408	ERDS2TJ332	1/4W 3.3K	R974	ERDS2TJ393	1/4W 39K (DECK1)
R45, 46	ERDS2TJ394	1/4W 390K	R409, 410	ERDS2TJ223	1/4W 22K	R974A	ERDS2TJ393	1/4W 39K (DECK2)
R47, 48	ERDS2TJ561	1/4W 560	R411, 412	ERDS2TJ473	1/4W 47K			CAPACITORS
R49, 50	ERDS2TJ222	1/4W 2.2K	R413, 414	ERDS2TJ104	1/4W 100K			
R53, 54	ERDS2TJ101	1/4W 100 (E, EB, EG)	R601-604	ERDS2TJ472	1/4W 4.7K	C3, 4	ECBT1H561KB5	50V 560P
R55	ERDS2TJ223	1/4W 22K	R605	ERDS2TJ1R0	1/4W 1.0	C5, 6	ECBT1H102YB5	50V 1000P
R56	ERDS2TJ332	1/4W 3.3K	R606, 607	ERDS2TJ472	1/4W 4.7K	C7, 8	ECBA1H561KB5	50V 680P
R59	ERDS2TJ393	1/4W 39K	R608	ERDS2TJ103	1/4W 10K	C10	ECEA1H561R1B	50V 0.1U
R60	ERDS2TJ333	1/4W 33K	R609	ERDS2TJ102	1/4W 1K	C11, 12	ECBT1E103ZF	25V 0.01U
R61, 62	ERDS2TJ562	1/4W 5.6K	R610	ERDS2TJ152	1/4W 1.5K	C13, 14	ECQB1H562JF3	50V 6800P
R63, 64	ERDS2TJ222	1/4W 2.2K	R611	ERDS2TJ101	1/4W 100	C15, 16	ECEA1A191	10V 100U
R67, 68	ERDS2TJ103	1/4W 10K	R612	ERDS2TJ562	1/4W 5.6K	C17	ECEA1H561R47B	50V 0.47U
R69, 70	ERDS2TJ682T	1/4W 6.8K	R613	ERDS2TJ682T	1/4W 6.8K	C18	ECEA1CKA100B	16V 10U
R80	ERDS2TJ561	1/4W 560	R614	ERDS2TJ222	1/4W 2.2K	C19, 20	ECKR2H121KB5	500V 120P
R150	ERDS2TJ103	1/4W 10K	R615	ERDS2TJ101	1/4W 100	C21, 22	ECEA1CKA100B	16V 10U
R158	ERDS2TJ223	1/4W 22K	R616	ERDS2TJ222	1/4W 2.2K	C23, 24	ECEA1HKA2R2B	50V 2.2U
R173	ERDS2TJ221	1/4W 220	R617, 618	ERDS2TJ101	1/4W 100	C25, 26	ECEA1HKA47B	50V 0.47U
R174-176	ERDS2TJ103	1/4W 10K	R619	ERDS2TJ331	1/4W 330	C27, 28	ECEA1CN100SB	16V 10U
R301, 302	ERDS2TJ153	1/4W 15K	R620, 621	ERDS2TJ101	1/4W 100	C29-32	ECEA1CKA100B	16V 10U
R303, 304	ERDS2TJ103	1/4W 10K	R622, 623	ERD2FCVJ6R8T	1/4W 6.8 Δ	C33, 34	ECEA1CKA220B	16V 22U
R305, 306	ERDS2TJ154	1/4W 150K	R624-626	ERD2FCVJ100T	1/4W 10 Δ	C35	ECKR1H392KB5	50V 3900P
R307	ERDS2TJ100	1/4W 10	R627	ERD2FCVJ6R8T	1/4W 6.8 Δ	C37, 38	ECEA1CKA220B	16V 22U
R308	ERDS2TJ1R0	1/4W 1.0	R628	ERDS2TJ101	1/4W 100	C39, 40	ECBT1E103ZF	25V 0.01U
R309	ERDS2TJ100	1/4W 10	R630	ERD2FCVJ6R8T	1/4W 6.8 Δ	C41, 42	ECEA1HKA010B	50V 1U
R310	ERD2FCVG270T	1/4W 27 Δ	R631, 632	ERD2FCVG270T	1/4W 27 Δ	C43, 44	ECEA1CKA100B	16V 10U
			R633	ERD2FCVJ6R8T	1/4W 6.8 Δ	C45, 46	ECBT1E103ZF	25V 0.01U (E, EB, EG)
			R634	ERDS2TJ101	1/4W 100	C61, 62	ECBT1H561KB5	50V 560P
			R635	ERDS2TJ561	1/4W 560			

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks			
C63	ECEA1CKA100B	16V 10U	C616, 617	ECA1AM102B	10V 1000U			
C64	ECEA1HKA010B	50V 1U	C618	ECA1HM221B	50V 220U Δ			
C65	ECBT1E103ZF	25V 0.01U	C619	ECBT1E103ZF	25V 0.01U			
C67, 68	ECBT1C472KR5	16V 4700P	C630	ECBT1E103ZF	25V 0.01U			
C151	ECEA0JU221	6.3V 220U	C700, 701	ECEA1CKA100B	16V 10U			
C152	ECBT1E103ZF	25V 0.01U	C702	ECBT1E103ZF	25V 0.01U			
C153	ECA0JM102B	6.3V 1000U	C703, 704	ECEA1CKA100B	16V 10U			
C154	ECBT1H331KB5	50V 330P	C705	ECEA1CKA100B	25V 4.7U			
C175	ECBT1H121KB5	50V 120P	C706, 707	ECEA1CKA100B	50V 0.1U (E, EB, EG)			
C301	ECBT1E103ZF	25V 0.01U	C710	ECEA1CKA100B	50V 1U			
C302	ECEA1CKA100B	16V 10U	C711	ECBT1E103ZF	25V 0.01U			
C303, 304	ECBT1C122KR5	16V 1200P	C801	ECBT1E223ZF	25V 0.022U (DECK1)			
C305, 306	ECQB1H103JF3	50V 0.01U	C802	ECBT1E223ZF	25V 0.022U (DECK2)			
C307, 308	ECQB1H223JF3	50V 0.022U	C803	ECEA1EKA101Q	25V 100U (DECK1)			
C309, 310	ECQV1H473JM3	50V 0.047U	C804	ECEA1AKA101B	10V 100U (DECK1)			
C311, 312	ECBT1H121KB5	50V 120P	C805	ECBT1H104ZF5	50V 0.1U (DECK1)			
C313, 314	ECKR2H821KB5	500V 820P	C806	ECBT1H104ZF5	50V 0.1U (DECK2)			
C315, 316	ECBT1E223ZF	25V 0.022U	C807	ECEA1EKA101Q	25V 100U (DECK2)			
C317	ECBT1H220J5	50V 22P	C808	ECEA1AKA101B	10V 100U (DECK2)			
C318	ECQP1153JZ	100V 0.015U	C811, 812	ECBT1H101KB5	50V 100P (DECK1)			
C320	ECBT1H220J5	50V 22P	C813	ECBT1H104ZF5	50V 0.1U (DECK1)			
C322	ECEA1AU221	10V 220U	C814	ECBT1H104ZF5	50V 0.1U (DECK2)			
C323	ECBT1E103ZF	25V 0.01U	C815, 816	ECBT1H101KB5	50V 100P (DECK2)			
C324	ECEA1EKA47B	25V 4.7U	C817	ECBT1H101KB5	50V 100P (DECK1)			
C325	ECKR1H392KB5	50V 3900P	C818	ECBT1H101KB5	50V 100P (DECK2)			
C326	ECEA1HKA0R1B	50V 0.1U	C821	ECEA0JKA221B	6.3V 220U (DECK1)			
C327	ECKW1H222KB5	50V 2200P	C822	ECEA0JKA221B	6.3V 220U (DECK2)			
C328	ECKD1H682KB	50V 6800P						
C329	ECKW1H222KB5	50V 2200P						
C330	ECBT1E103ZF	25V 0.01U						
C332, 333	ECBT1E103ZF	25V 0.01U						
C401, 402	ECBT1C222KR5	16V 2200P						
C403, 404	ECBT1C182KR5	16V 1800P						
C405, 406	ECBT1C222KR5	16V 2200P						
C407, 408	ECQV1H154JM3	50V 0.15U						
C409, 410	ECEA1HKA010B	50V 1U						
C411, 412	ECEA1HKA2R2B	50V 2.2U						
C413, 414	ECEA1HKA010B	50V 1U						
C415, 416	ECQB1H152JF3	50V 1500P						
C417, 418	ECEA1HKAR47B	50V 0.47U						
C419, 420	ECQB1H152JF3	50V 1500P						
C421, 422	ECEA1HKAR47B	50V 0.47U						
C423, 424	ECBT1H820KB5	50V 82P						
C425, 426	ECBT1C682KR5	16V 6800P						
C601	ECEA1EU222B	25V 2200U Δ						
C602	ECA1EM221B	25V 220U						
C603, 604	ECA1EM102B	25V 1000U Δ						
C605	ECKR2H682PE	500V 6800P						
C606	ECBT1E103ZF	25V 0.01U						
C607	ECEA1AU221	10V 220U						
C608-614	ECBT1E103ZF	25V 0.01U						
C615	ECEA1CKA100B	16V 10U						